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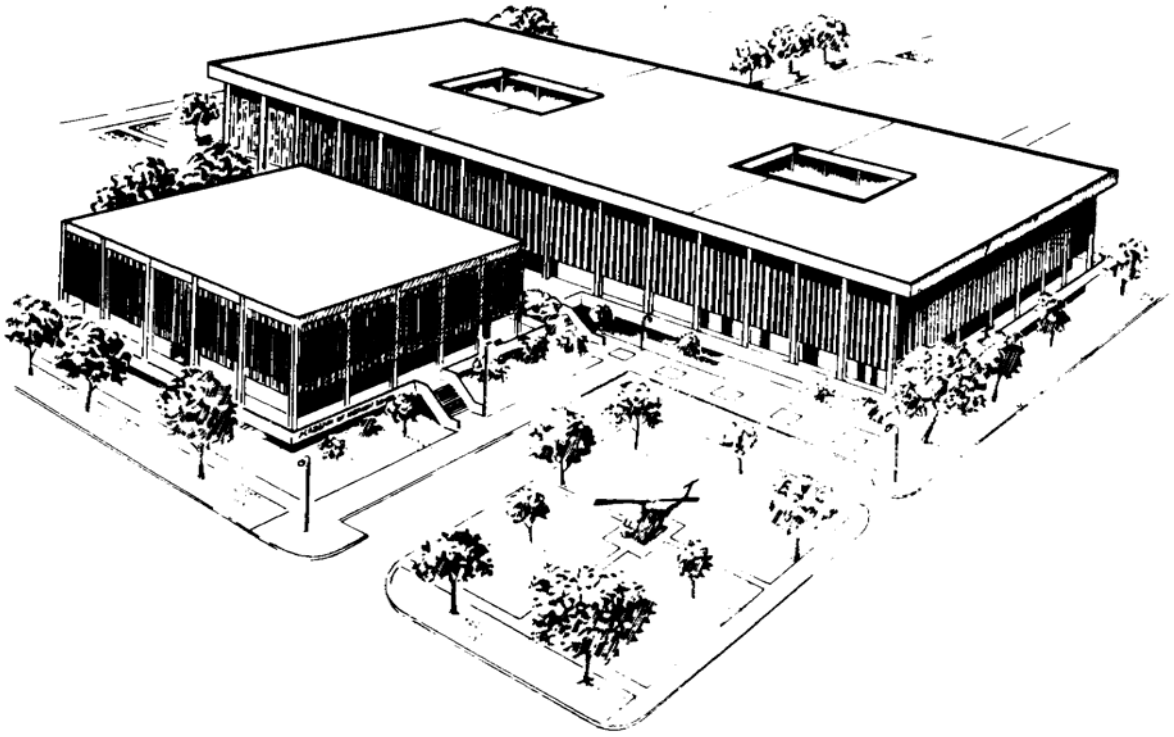
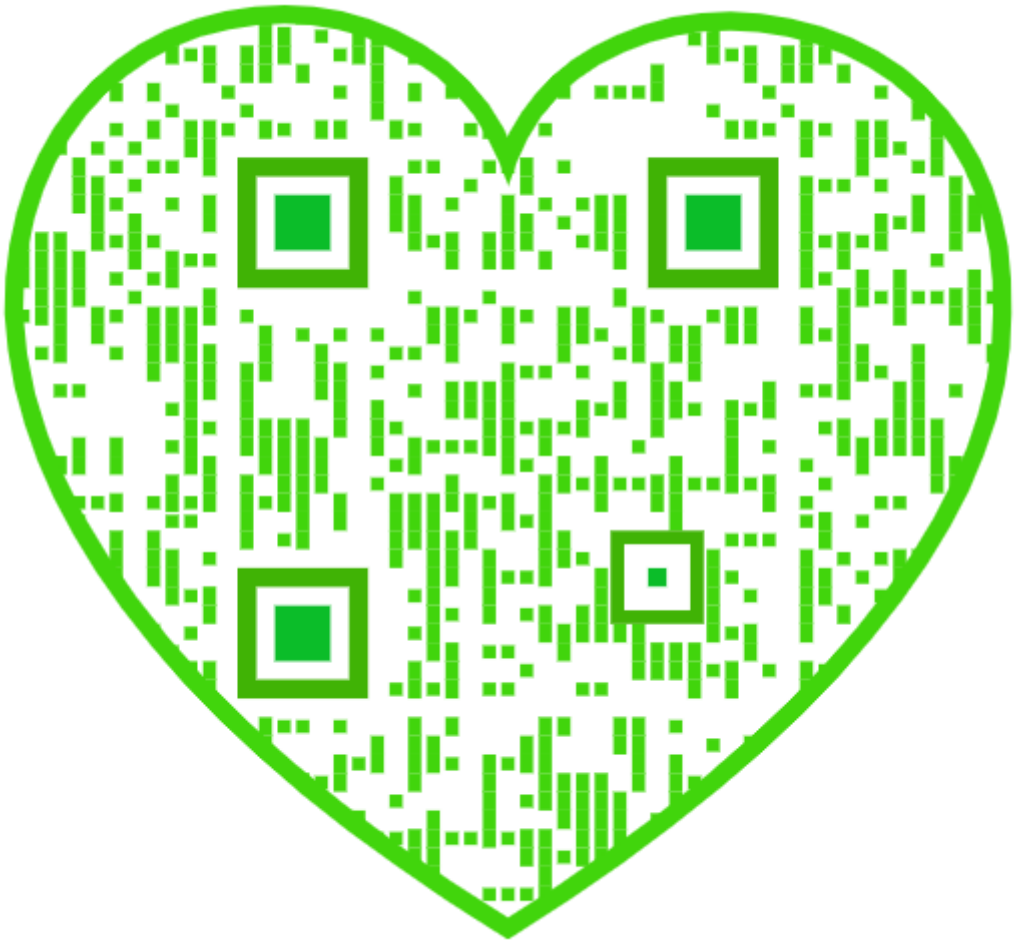


OBSTETRIC AND NEWBORN CARE I

SUBCOURSE MD0921 EDITION 200



DEVELOPMENT

This subcourse is approved for resident and correspondence course instruction. It reflects the current thought of the Academy of Health Sciences and conforms to printed Department of the Army doctrine as closely as currently possible. Development and progress render such doctrine continuously subject to change.

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CLARIFICATION OF TRAINING LITERATURE TERMINOLOGY

When used in this publication, words such as "he," "him," "his," and "men" are intended to include both the masculine and feminine genders, unless specifically stated otherwise or when obvious in context.
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TABLE OF CONTENTS

Lesson		Paragraphs
	INTRODUCTION	
	UNIVERSAL BODY SUBSTANCE PRECAUTIONS	
1.	REPRODUCTIVE ANATOMY AND PHYSIOLOG	1-1--1-12
	Section I. The Female Reproductive System	1-1--1-8
	Section II. The Male Reproductive System	1-9--1-12
	Exercises	
2.	EMBRYOLOGY AND FETAL DEVELOPMENT	2-1--2-15
	Exercises	
3.	DIAGNOSIS OF PREGNANCY	3-1---7
	Exercises	
4.	PSYCHOLOGIC NEEDS DURING PREGNANCY	4-1--4-11
	Exercises	
5.	PHYSIOLOGIC CHANGES DURING PREGNANCY	5-1--5-12
	Exercises	
6.	PRENATAL CARE DURING PREGNANCY	6-1--6-5
	Exercises	
7.	PERSONAL HYGIENE AND CARE DURING PREGNANCY	7-1--7-4
	Exercises	
8.	MINOR DISCOMFORTS OF PREGNANCY	8-1--8-7
	Exercises	
9.	PATIENT EDUCATION DURING PREGNANCY	9-1--9-8
	Exercises	
10.	FETAL POSITIONS AND ADAPTATIONS	10-1--10-4
	Exercises	
	GLOSSARY	

SUBCOURSE MD0921

OBSTETRIC AND NEWBORN CARE I

INTRODUCTION

Obstetrics is the branch of medicine concerned with the management of childbirth. The ultimate goal of all workers in the field of obstetrics is to assist a mother to produce a healthy baby, with a minimum of danger and discomfort to both. Pregnancy is defined as the condition of being "with child." To understand pregnancy, we must know how it begins, how the fetus grows in the uterus, and how it affects the mother.

Today, more than ever before nurses play a central role in the planning for and the experience of birth, and in how families feel about the experience afterwards. You, as a practical nurse, should be knowledgeable of all aspects of maternal nursing. And, by applying this knowledge you will develop skills and experience in providing quality nursing care.

Subcourse Components:

The subcourse instructional material consists of the following:

Introduction

Universal Body Substance Precautions

Lesson 1, Reproductive Anatomy and Physiology.

Lesson 2, Embryology and Fetal Development.

Lesson 3, Diagnosis of Pregnancy.

Lesson 4, Psychologic Needs During Pregnancy.

Lesson 5, Physiologic Changes During Pregnancy.

Lesson 6, Prenatal Care During Pregnancy.

Lesson 7, Personal Hygiene and Care During Pregnancy.

Lesson 8, Minor Discomforts of Pregnancy.

Lesson 9, Patient Education During Pregnancy.

Lesson 10, Fetal Positions and Adaptations.

Glossary

Study Suggestions:

Here are some suggestions that may be helpful to you in completing this subcourse:

--Read and study each lesson carefully.

--Complete the subcourse lesson by lesson. After completing each lesson, work the exercises at the end of the lesson, marking your answers in this booklet.

--After completing each set of lesson exercises, compare your answers with those on the solution sheet that follows the exercises. If you have answered an exercise incorrectly, check the reference cited after the answer on the solution sheet to determine why your response was not the correct one.

Credit Awarded:

To receive credit hours, you must be officially enrolled and complete an examination furnished by the Nonresident Instruction Branch at Fort Sam Houston, Texas. Upon successful completion of the examination for this subcourse, you will be awarded 13 credit hours.

You can enroll by going to the web site http://atrrs.army.mil and enrolling under "Self Development" (School Code 555).

A listing of correspondence courses and subcourses available through the Nonresident Instruction Section is found in Chapter 4 of DA Pamphlet 350-59, Army Correspondence Course Program Catalog. The DA PAM is available at the following website: http://www.usapa.army.mil/pdffiles/p350-59.pdf.

UNIVERSAL BODY SUBSTANCE PRECAUTIONS

Prevention of Transmission of Human Immunodeficiency Virus and Other Blood-Borne Pathogens in Health Care Settings

Only blood, semen, vaginal secretions, and possibly breast milk have been implicated in transmission of human immunodeficiency virus (HIV), hepatitis B virus (HBV), and other blood-borne pathogens.

Blood is the single most important source of transmission of blood-borne pathogens in health care settings. Infection control efforts must focus on preventing exposures to blood.

Although the risk is unknown, universal precautions also apply to tissues and to cerebrospinal fluid, synovial fluid, pleural fluid, peritoneal fluid, and amniotic fluid.

Universal precautions do not apply to feces, nasal secretions, sputum, sweat, tears, urine, and vomitus unless they contain visible blood. Although universal precautions do not apply to these body substances, the wise nurse wears gloves for protection from other infections.

Precautions are used for *all* patients. (*Reason:* It is impossible to know which patients are infected with such conditions as HIV, HBV, or other infectious agents.)

Gloves are worn *whenever* the health care worker may come in contact with blood, body fluids containing blood, and other body fluids to which universal precautions apply. (*Reason:* Diseases can be carried in the body substances.)

Wear gloves *at all times* if you have any break in the skin of your hands. If you have an exudative condition, such as weeping dermatitis, you must be evaluated before working with patients and patient care equipment. (*Reason:* You may be at great risk of contracting a disease; you might also spread disease.)

Change gloves after each contact with a client. (*Reason:* The gloves may be contaminated.)

Wash your hands and skin surfaces immediately and thoroughly if they are contaminated with blood or body fluids. (*Reason:* Proper washing will help to stop the spread of infection.)

Wear a gown or apron when clothing could become soiled. (*Reason:* To prevent spread of infection to yourself or others.)

Wear a mask and eye protection if splashing is possible. Hospital protocol will determine what type of eye protection is required for each specific case. (*Reason:* Infection could enter your body through the mucous membranes of your mouth or nose or through your eyes.)

Dispose of sharp objects carefully. Do not recap or break needles. Needles and sharp objects are placed in a special container after use. (*Reason:* There is a possibility of accidental finger stick. It is important to protect yourself and housekeeping personnel.)

If you have an on-the-job accident that causes a break in the skin, notify your nursing supervisor *immediately*. (*Reason:* Immediate precautions must be taken to protect you.)

Special care is taken of a deceased patient's body. (*Reason:* To prevent leakage of body substances. It is safer to assume that all patients are infectious.)

All health care workers who perform or assist in vaginal or cesarean delivery should wear gloves and gowns when handling the placenta or the infant until blood and amniotic fluid have been removed from the infant's skin. Gloves should be worn until after postdelivery care of the umbilical cord.

Pregnant health care workers are not known to be at greater risk of contracting HIV infection than health care workers who are not pregnant; however, if a health care worker develops HIV infection during pregnancy, the infant is at risk. Because of this risk, pregnant health care workers should be especially familiar with and strictly adhere to precautions to minimize the risk of HIV transmission.

(Adapted from Centers for Disease Control: Recommendations for prevention of HIV transmission in health care settings. MMWR 36: Suppl. 25: 1987. Centers for Disease Control: Update: Universal precautions for prevention or transmission of human immunodeficiency virus, hepatitis B virus, and other blood-borne pathogens in health-care settings. MMWR 37: 24, 1988)

End of Universal Body Substance Precautions

LESSON ASSIGNMENT

LESSON 1 Reproductive Anatomy and Physiology.

TEXT ASSIGNMENT Paragraphs 1-1 through 1-12.

LESSON OBJECTIVES After completing this lesson, you should be able to:

1-1. Identify terms and definitions that are related to the female and male reproductive system.

1-2. Identify descriptive phrases concerning anatomical locations of the female reproductive system.

1-3. Match names of the female reproductive system to an anatomical drawing of the female.

1-4. Identify the functions of specific parts of the female reproductive system.

1-5. Identify steps in the process of oogenesis.

1-6. Select descriptive phrases concerning the influence of estrogen on the female body.

1-7. Select descriptive phrases concerning the influence of progesterone on the body.

1-8. Identify physiological phenomenon, which occur during specific times of the menstrual cycle.

1-9. Select descriptive phrases describing the location/gross anatomy of the male reproductive anatomy.

1-10. Identify anatomical names and match the anatomical names with the correct parts of the male reproduction system.

1-11. Identify the functions of the male reproductive system.

1-12. Identify the steps describing the phases of spermatogenesis.

1-13. Identify parts of the sperm.

1-14. Identify the correct effects of testosterone.

SUGGESTION

After studying the assignment, complete the exercises at the end of this lesson. These exercises will help you to achieve the lesson objectives.

LESSON 1

REPRODUCTIVE ANATOMY AND PHYSIOLOGY

Section I. THE FEMALE REPRODUCTIVE SYSTEM

1-1. GENERAL

The organs of the reproductive systems are concerned with the general process of reproduction, and each is adapted for specialized tasks. These organs are unique in that their functions are not necessary for the survival of each individual. Instead, their functions are vital to the continuation of the human species. In providing maternity gynecologic health care to women, you will find that it is vital to your career as a practical nurse and to the patient that you will require a greater depth and breadth of knowledge of the female anatomy and physiology than usual. The female reproductive system consists of internal organs and external organs. The internal organs are located in the pelvic cavity and are supported by the pelvic floor. The external organs are located from the lower margin of the pubis to the perineum. The appearance of the external genitals varies greatly from woman to woman, since age, heredity, race, and the number of children a woman has borne determine the size, shape, and color. See figure 1-1 for the female reproductive organs.

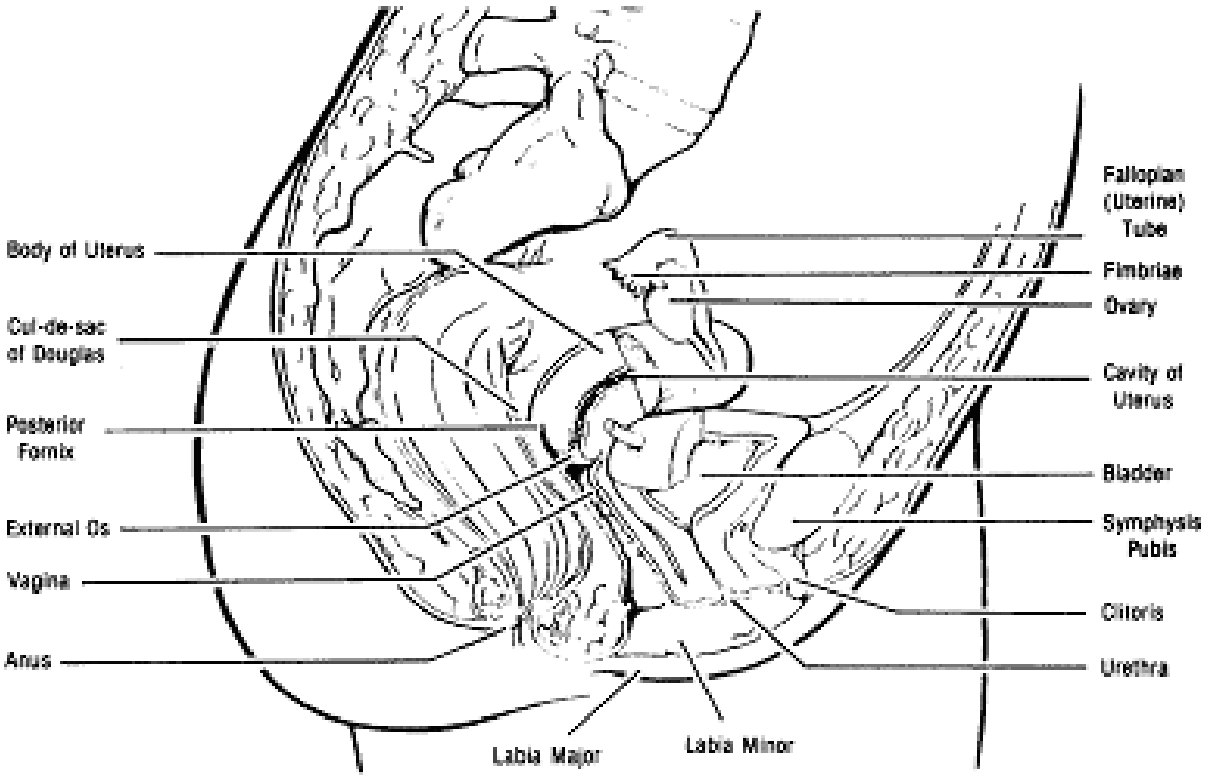


Figure 1-1. The female reproductive organs (sagittal section).

1-2. TERMS AND DEFINITIONS

These are only a few terms and definitions that will be used in this lesson. Other terms and definitions will be dispersed throughout the lesson.

a. **Broad Ligaments**. Two wing-like structures that extend from the lateral margins of the uterus to the pelvic walls and divide the pelvic cavity into an anterior and a posterior compartment.

b. **Corpus Luteum**. The yellow mass found in the graafian follicle after the ovum has been expelled.

c. **Estrogen**. The generic term for the female sex hormones. It is a steroid hormone produced primarily by the ovaries but also by the adrenal cortex.

d. **Fimbriae**. Fringes; especially the finger-like ends of the fallopian tube.

e. **Follicle**. A pouch like depression or cavity.

f. **Follicle Stimulating Hormone**. The follicle stimulating hormone (FSH) is a hormone produced by the anterior pituitary during the first half of the menstrual cycle. It stimulates development of the graafian follicle.

g. **Graafian Follicle**. A mature, fully developed ovarian cyst containing the ripe ovum.

h. **Hormone**. A chemical substance produced in an organ, which, being carried to an associated organ by the bloodstream excites in the latter organ, a functional activity.

i. **Lactation**. The production of milk by the mammary glands.

j. **Luteinizing Hormone**. A hormone produced by the anterior pituitary that stimulates ovulation and the development of the corpus luteum.

k. **Oocyte**. A developing egg in one of two stages.

l. **Ovum**. The female reproductive cell.

m. **Progesterone**. The pure hormone contained in the corpora lutea whose function is to prepare the endometrium for the reception and development of the fertilized ovum.

n. **Reproduction**. The process by which an offspring is formed.

1-3. INTERNAL FEMALE ORGANS

The internal organs of the female consists of the uterus, vagina, fallopian tubes, and the ovaries (see figures 1-1 and 1-2).

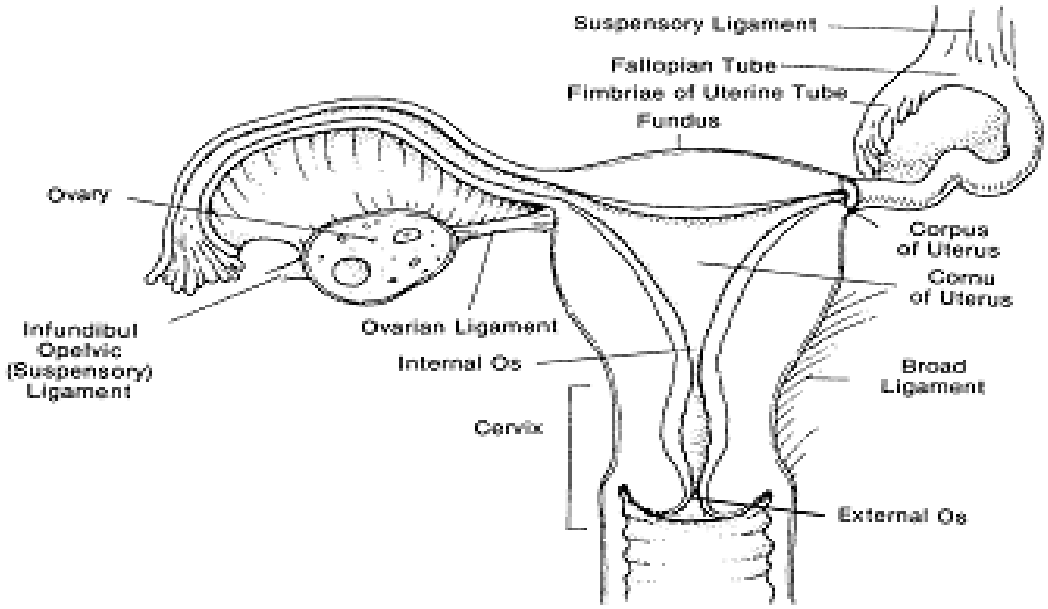


Figure 1-2. Anterior view of the uterus and related structures.

a. **Uterus**. The uterus is a hollow organ about the size and shape of a pear. It serves two important functions: it is the organ of menstruation and during pregnancy it receives the fertilized ovum, retains and nourishes it until it expels the fetus during labor.

(1) Location. The uterus is located between the urinary bladder and the rectum. It is suspended in the pelvis by broad ligaments.

(2) Divisions of the uterus. The uterus consists of the body or corpus, fundus, cervix, and the isthmus. The major portion of the uterus is called the body or corpus. The fundus is the superior, rounded region above the entrance of the fallopian tubes. The cervix is the narrow, inferior outlet that protrudes into the vagina. The isthmus is the slightly constricted portion that joins the corpus to the cervix.

(3) Walls of the uterus (see figure 1-3) . The walls are thick and are composed of three layers: the endometrium, the myometrium, and the perimetrium. The endometrium is the inner layer or mucosa. A fertilized egg burrows into the endometrium (implantation) and resides there for the rest of its development. When the female is not pregnant, the endometrial lining sloughs off about every 28 days in response to changes in levels of hormones in the blood. This process is called menses. The myometrium is the smooth muscle component of the wall. These smooth muscle fibers are arranged. In longitudinal, circular, and spiral patterns, and are interlaced with connective tissues. During the monthly female cycles and during pregnancy, these

layers undergo extensive changes. The perimetrium is a strong, serous membrane that coats the entire uterine corpus except the lower one fourth and anterior surface where the bladder is attached.

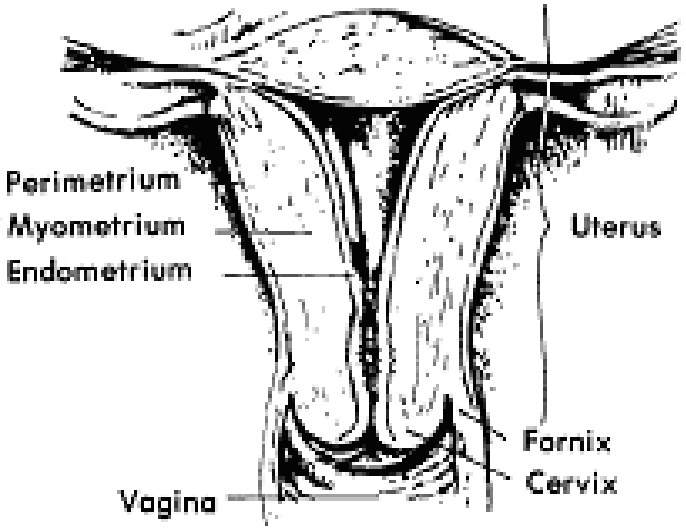


Figure 1-3. Walls of the uterus.

b. **Vagina**.

(1) Location. The vagina is the thin in walled muscular tube about 6 inches long leading from the uterus to the external genitalia. It is located between the bladder and the rectum.

(2) Function. The vagina provides the passageway for childbirth and menstrual flow; it receives the penis and semen during sexual intercourse.

c. **Fallopian Tubes (Two)**.

(1) Location. Each tube is about 4 inches long and extends medially from each ovary to empty into the superior region of the uterus.

(2) Function. The fallopian tubes transport ovum from the ovaries to the uterus. There is no contact of fallopian tubes with the ovaries.

(3) Description. The distal end of each fallopian tube is expanded and has finger-like projections called fimbriae, which partially surround each ovary. When an oocyte is expelled from the ovary, fimbriae create fluid currents that act to carry the oocyte into the fallopian tube. Oocyte is carried toward the uterus by combination of tube peristalsis and cilia, which propel the oocyte forward. The most desirable place for fertilization is the fallopian tube.

d. **Ovaries** (2) (see figure 1-4).

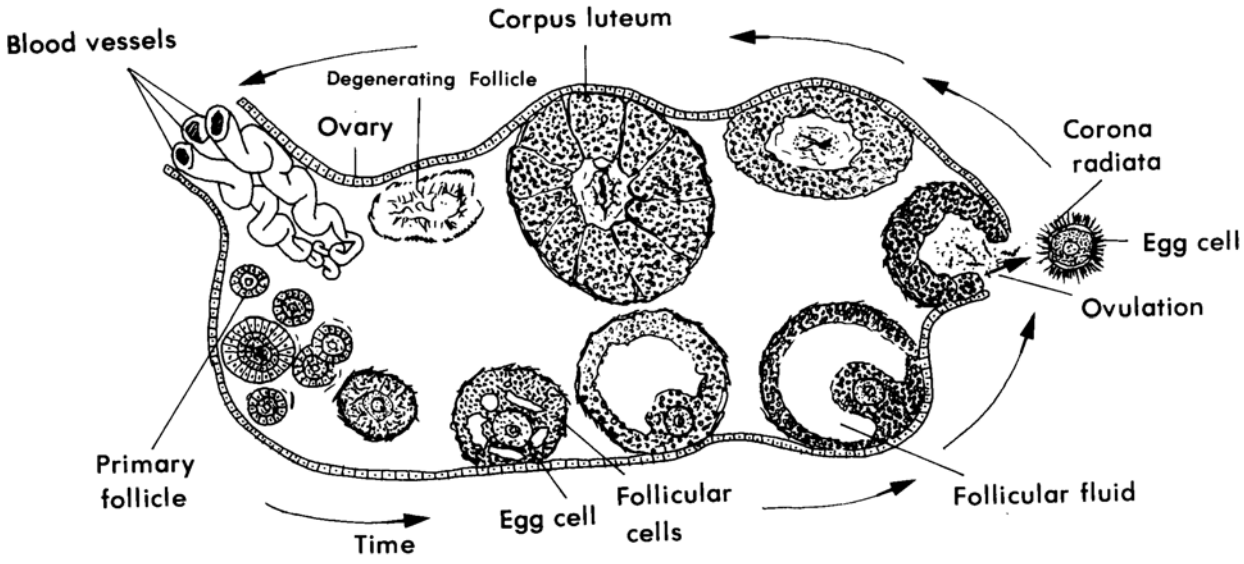


Figure 1-4. Human ovary.

(1) Functions. The ovaries are for oogenesis-the production of eggs (female sex cells) and for hormone production (estrogen and progesterone).

(2) Location and gross anatomy. The ovaries are about the size and shape of almonds. They lie against the lateral walls of the pelvis, one on each side. They are enclosed and held in place by the broad ligament. There are compact like tissues on the ovaries, which are called ovarian follicles. The follicles are tiny sac-like structures that consist of an immature egg surrounded by one or more layers of follicle cells. As the developing egg begins to ripen or mature, follicle enlarges and develops a fluid filled central region. When the egg is matured, it is called a graafian follicle, and is ready to be ejected from the ovary.

(3) Process of egg production--oogenesis (see figure 1-5).

(a) The total supply of eggs that a female can release has been determined by the time she is born. The eggs are referred to as "oogonia" in the developing fetus. At the time the female is born, oogonia have divided into primary oocytes, which contain 46 chromosomes and are surrounded by a layer of follicle cells.

(b) Primary oocytes remain in the state of suspended animation through childhood until the female reaches puberty (ages 10 to 14 years). At puberty, the anterior pituitary gland secretes follicle-stimulating hormone (FSH), which stimulates a small number of primary follicles to mature each month.

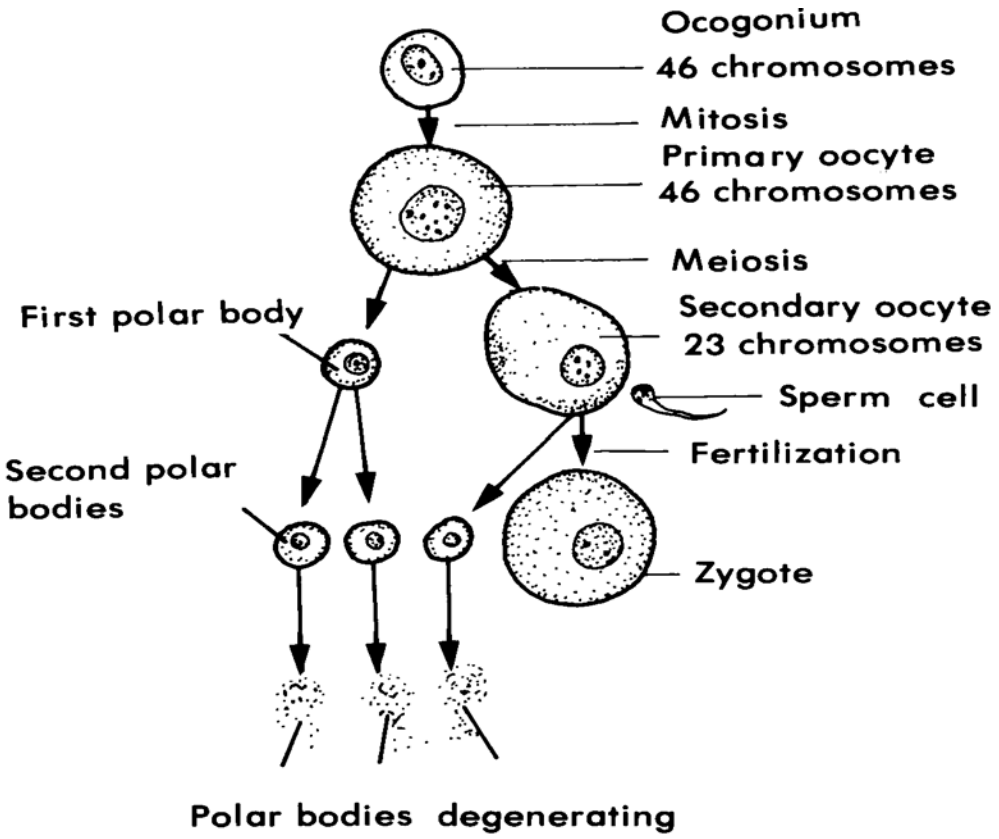


Figure 1-5. The process of oogenesis.

(c) As a primary oocyte begins dividing, two different cells are produced, each containing 23 unpaired chromosomes. One of the cells is called a secondary oocyte and the other is called the first polar body. The secondary oocyte is the larger cell and is capable of being fertilized. The first polar body is very small, is nonfunctional, and incapable of being fertilized.

(d) By the time follicles have matured to the graafian follicle stage, they contain secondary oocytes and can be seen bulging from the surface of the ovary. Follicle development to this stage takes about 14 days. Ovulation (ejection of the mature egg from the ovary) occurs at this 14-day point in response to the luteinizing hormone (LH), which is released by the anterior pituitary gland.

(e) The follicle at the proper stage of maturity when the LH is secreted will rupture and release its oocyte into the peritoneal cavity. The motion of the fimbriae draws the oocyte into the fallopian tube. The luteinizing hormone also causes the ruptured follicle to change into a granular structure called corpus luteum, which secretes estrogen and progesterone.

(f) If the secondary oocyte is penetrated by a sperm, a secondary division occurs that produces another polar body and an ovum, which combines its 23

chromosomes with those of the sperm to form the fertilized egg, which contains 46 chromosomes.

(4) Process of hormone production by the ovaries.

(a) Estrogen is produced by the follicle cells, which are responsible for secondary sex characteristics and for the maintenance of these traits. These secondary sex characteristics include the enlargement of fallopian tubes, uterus, vagina, and external genitals; breast development; increased deposits of fat in hips and breasts; widening of the pelvis; and onset of menses or menstrual cycle.

(b) Progesterone is produced by the corpus luteum in presence of LH in the blood. It works with estrogen to produce a normal menstrual cycle. Progesterone is important during pregnancy and in preparing the breasts for milk production.

1-4. EXTERNAL FEMALE GENITALIA

The external organs of the female reproductive system include the mons pubis, labia majora, labia minora, vestibule, perineum, and the Bartholin's glands. As a group, these structures that surround the openings of the urethra and vagina compose the vulva, from the Latin word meaning covering. See Figure 1-6.

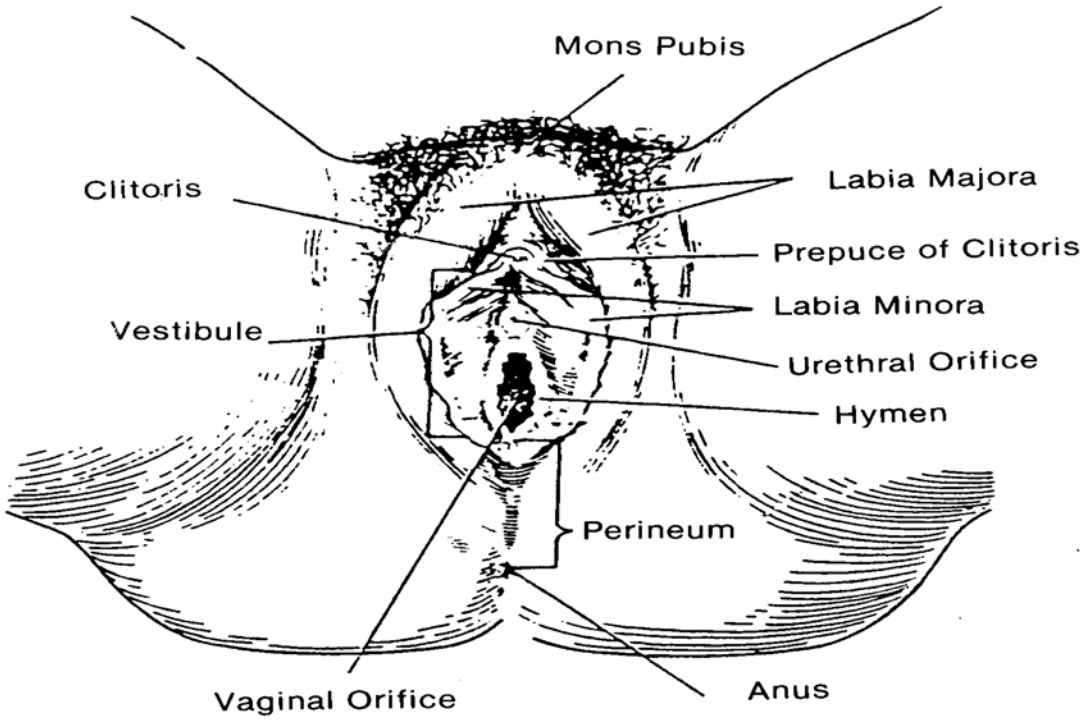


Figure 1-6. External female genitalia.

a. **Mons Pubis**. This is the fatty rounded area overlying the symphysis pubis and covered with thick coarse hair.

b. **Labia Majora**. The labia majora run posteriorly from the mons pubis. They are the 2 elongated hair covered skin folds. They enclose and protect other external reproductive organs.

c. **Labia Minora**. The labia minora are 2 smaller folds enclosed by the labia majora. They protect the opening of the vagina and urethra.

d. **Vestibule**. The vestibule consists of the clitoris, urethral meatus, and the vaginal introitus.

(1) The clitoris is a short erectile organ at the top of the vaginal vestibule whose function is sexual excitation.

(2) The urethral meatus is the mouth or opening of the urethra. The urethra is a small tubular structure that drains urine from the bladder.

(3) The vaginal introitus is the vaginal entrance.

e. **Perineum.** This is the skin covered muscular area between the vaginal opening (introitus) and the anus. It aids in constricting the urinary, vaginal, and anal opening. It also helps support the pelvic contents.

f. **Bartholin's Glands (Vulvovaginal or Vestibular Glands)**. The Bartholin's glands lie on either side of the vaginal opening. They produce a mucoid substance, which provides lubrication for intercourse.

1-5. BLOOD SUPPLY

The blood supply is derived from the uterine and ovarian arteries that extend from the internal iliac arteries and the aorta. The increased demands of pregnancy necessitate a rich supply of blood to the uterus. New, larger blood vessels develop to accommodate the need of the growing uterus. The venous circulation is accomplished via the internal iliac and common iliac vein.

1-6. FACTS ABOUT THE MENSTRUAL CYCLE

Menstruation is the periodic discharge of blood, mucus, and epithelial cells from the uterus. It usually occurs at monthly intervals throughout the reproductive period, except during pregnancy and lactation, when it is usually suppressed.

a. The menstrual cycle is controlled by the cyclic activity of follicle stimulating hormone (FSH) and LH from the anterior pituitary and progesterone and estrogen from

the ovaries. In other words, FSH acts upon the ovary to stimulate the maturation of a follicle, and during this development, the follicular cells secrete increasing amounts of estrogen (see figure 1-7).

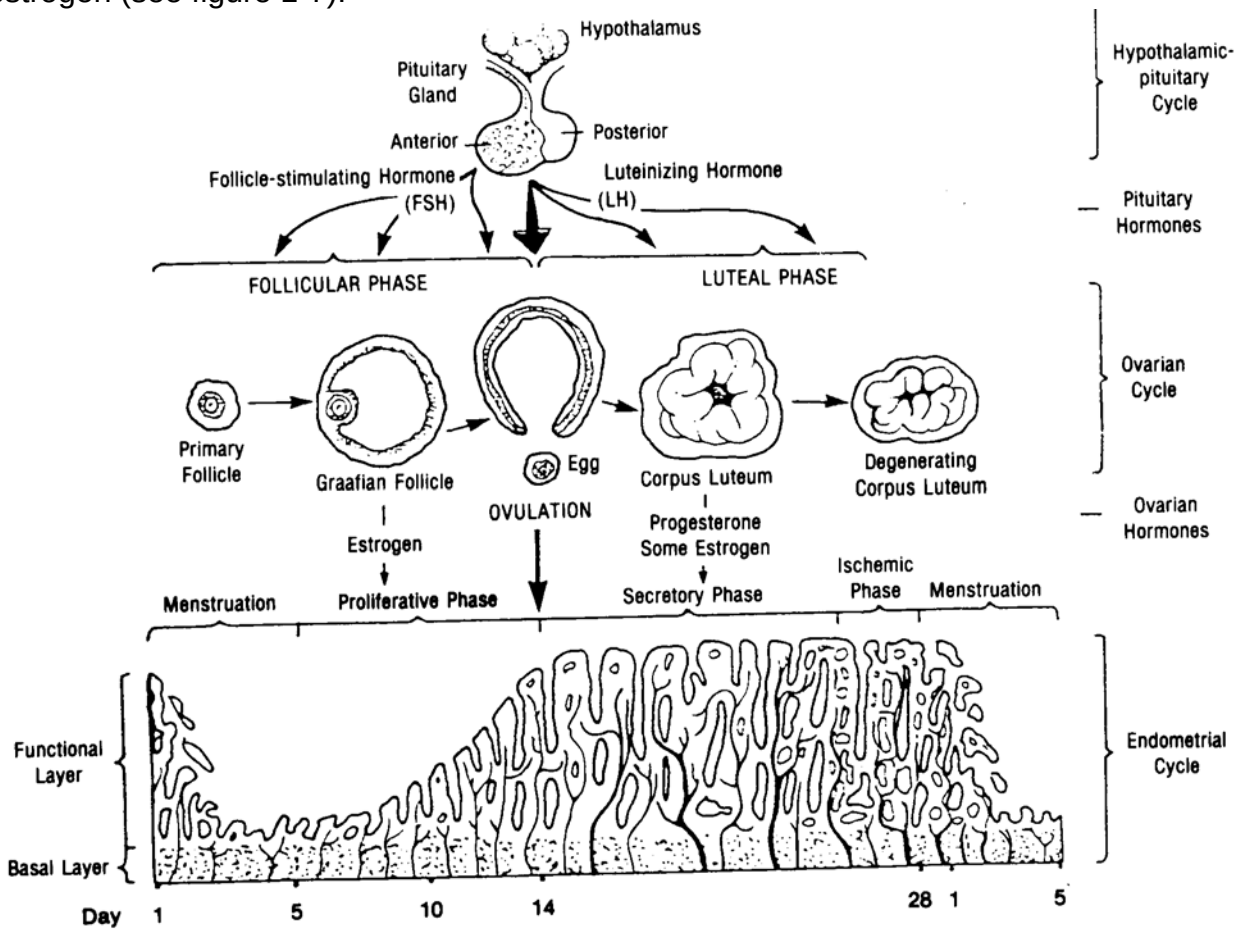


Figure 1-7. Menstrual cycle.

b. Hormonal interaction of the female cycle are as follows:

(1) Days 1-5. This is known as the menses phase. A lack of signal from a fertilized egg influences the drop in estrogen and progesterone production. A drop in progesterone results in the sloughing off of the thick endometrial lining which is the menstrual flow. This occurs for 3 to 5 days.

(2) Days 6-14. This is known as the proliferative phase. A drop in progesterone and estrogen stimulates the release of FSH from the anterior pituitary. FSH stimulates the maturation of an ovum with graafian follicle. Near the end of this phase, the release of LH increases causing a sudden burst like release of the ovum, which is known as ovulation.

(3) Days 15-28. This is known as the secretory phase. High levels of LH cause the empty graafian follicle to develop into the corpus luteum. The corpus luteum releases progesterone, which increases the endometrial blood supply. Endometrial

glands secrete nutrients into the uterine cavity, helping to prepare the lining for the arrival of the fertilized egg. If the egg is fertilized, the embryo produces human chorionic gonadotropin (HCG). Thehuman chorionic gonadotropin signals the corpus luteum to continue to supply progesterone to maintain the uterine lining. Continuous levels of progesterone prevent the release of FSH and ovulation ceases.

c. **Additional Information**.

(1) The length of the menstrual cycle is highly variable. It may be as short as 21 days or as long as 39 days.

(2) Only one interval is fairly constant in all females, the time from ovulation to the beginning of menses, which is almost always 14-15 days.

(3) The menstrual cycle usually ends when or before a woman reaches her fifties. This is known as menopause.

1-7. OVULATION

Ovulation is the release of an egg cell from a mature ovarian follicle (see figure 1-5 for ovulation). Ovulation is stimulated by hormones from the anterior pituitary gland, which apparently causes the mature follicle to swell rapidly and eventually rupture. When this happens, the follicular fluid, accompanied by the egg cell, oozes outward from the surface of the ovary and enters the peritoneal cavity. After it is expelled from the ovary, the egg cell and one or two layers of follicular cells surrounding it are usually propelled to the opening of a nearby uterine tube. If the cell is not fertilized by union of a sperm cell within a relatively short time, it will degenerate.

1-8. MENOPAUSE

As mentioned in paragraph 1-6c(3), menopause is the cessation of menstruation. This usually occurs in women between the ages of 45 and 50. Some women may reach menopause before the age of 45 and some after the age of 50. In common use, menopause generally means cessation of regular menstruation. Ovulation may occur sporadically or may cease abruptly. Periods may end suddenly, may become scanty or irregular, or may be intermittently heavy before ceasing altogether. Markedly diminished ovarian activity, that is, significantly decreased estrogen production and cessation of ovulation, causes menopause.

Section II. THE MALE REPRODUCTIVE SYSTEM

1-9. GENERAL

a. The male reproductive tract consists of external genitals and internal organs. These organs are located in the pelvic cavity (see figure 1-8). The male's reproductive system begins to develop in response to testosterone during early fetal life. Essentially

no testosterone is produced during childhood. Resumption of testosterone production at the onset of puberty stimulates growth and maturation of the male's reproductive structures and secondary sex characteristics. Testosterone is the male sex hormone secreted by the interstitial cells of the testes.

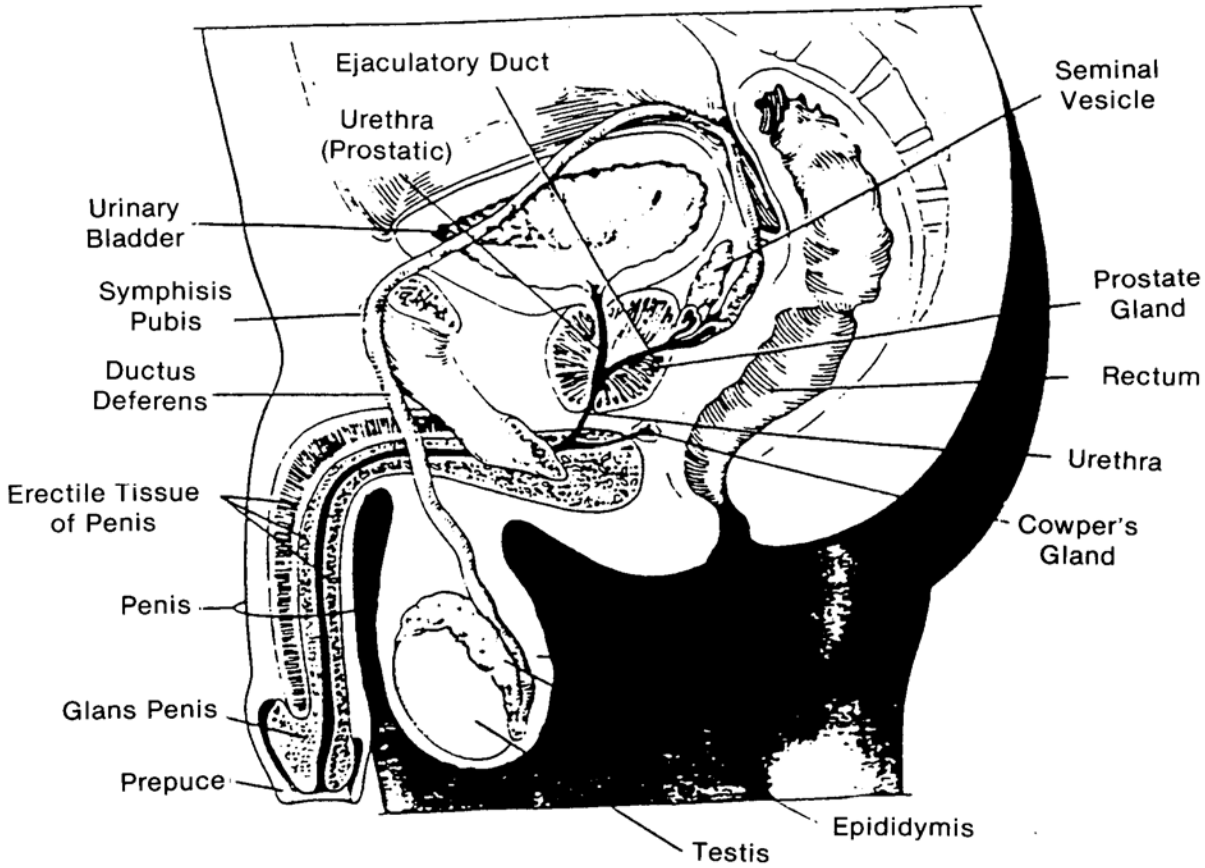


Figure 1-8. The male reproductive organs.

b. The primary function of the male's reproduction system is to produce male sex cells, which are called sperm cells. The primary organs of the male's reproduction system are the two testes in which the sperm cells are formed. The other structures are the duct system and the accessory glandular structure.

1-10. MALE REPRODUCTIVE ORGANS

a. **Testes (Two)**. The testes are two almond-shaped glands whose functions are for the production of sperm and testosterone. The testes are suspended in the scrotal sac outside the abdominopelvic cavity. It is believed that the testes lie outside the body cavity because they are very sensitive to heat and the higher temperature within the body is unfavorable to the production of sperm. Each testis is enclosed by a tough, white fibrous capsule called the tunica albuginea. Extension of the capsule divides it into a large number of lobes. Each lobe contains four tightly coiled seminiferous tubules (this is the location of actual sperm production). The seminiferous tubules empty sperm

into the testicular network where they travel to the epididymis. The epididymis is located outside of the testis (see figures 1-8 and 1-9).

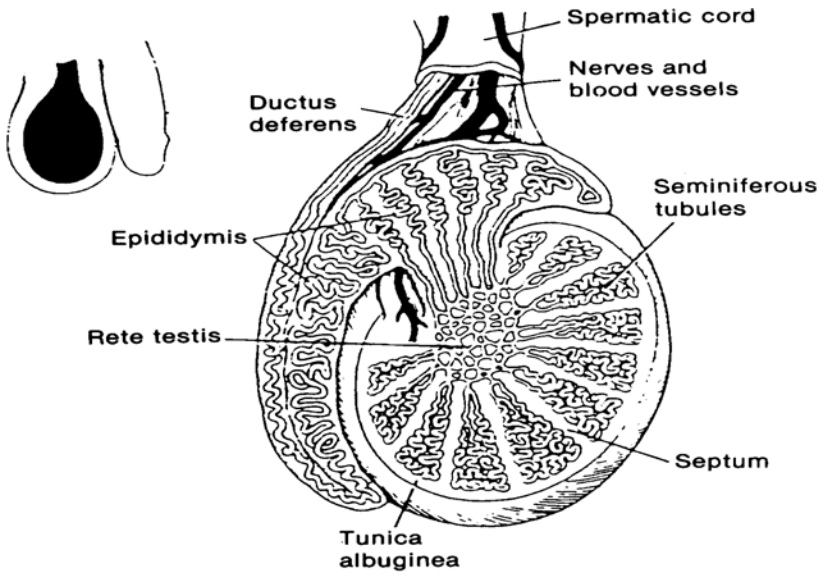


Figure 1-9. Structure of the testes.

b. **Duct System**. The duct system is the passageway for the sperm to exit the body. It contains the epididymis and the vas deferens.

(1) Epididymis. The epididymis is a coiled tube about 20 inches long. It caps the superior part of the testis and runs down its posterior side. It forms the first part of the duct system and provides a temporary storage site for immature sperm. When the male is sexually stimulated, the walls of the epididymis contract to expel sperm into the next part of the duct system.

(2) Vas deferens (ductus deferens). The sperm continue their journey through the vas deferens. The vas deferens runs upwards from the epididymis through the inguinal canal into the pelvic cavity and arches over the bladder (see figure 1-8). It is enclosed with blood vessels and nerves in a connective tissue sheath, which is called a spermatic cord. The vas deferens empties into the ejaculatory duct that carries the sperm through the process to empty into the urethra.

c. **Accessory Glandular Structure**. The accessory glandular structure includes the seminal vesicles, prostate gland, Cowper's glands, and the penis.

(1) Seminal vesicles. The two seminal vesicles are pouches that store sperm. Sixty percent of fluid volume of semen (seminal fluid) is produced there. The secretion is rich in sugar (fructose), which nourishes and activates the sperm passing through the tract.

(2) Prostate gland. The prostate gland is a single gland about the size and shape of a chestnut. It encircles the upper area of the urethra just below the bladder. It secretes a milky alkaline fluid, which has the role in protecting the sperm against acid conditions of the vagina.

(3) Cowper's glands. The cowper's glands are tiny pea-sized glands inferior to the prostate. They form a thick, clear mucus, which drains into the urethra. The secretion is believed to serve primarily as a lubricant during sexual intercourse.

(4) Penis. The penis is a cylinder-shaped organ located externally on the mons pubis, immediately above the scrotum. It is made of erectile tissue with cavern-like spaces in it. At the time of sexual excitement, blood fills these spaces, changing the soft, limp penis to an enlarged, rigid, erect organ. The smooth cap of the penis is called the glans penis and is covered by a fold of loose skin that forms the headlock foreskin. Surgical removal of this foreskin, called circumcision, is frequently performed. The penis also serves as part of the urinary tract in the male.

1-11. SPERMATOGENESIS (SPERM FORMATION)

a. Spermatogenesis begins during puberty and continues throughout life.

b. Millions of sperm are produced in a 24-hour period. This occurs in the seminiferous tubules (see figure 1-10).

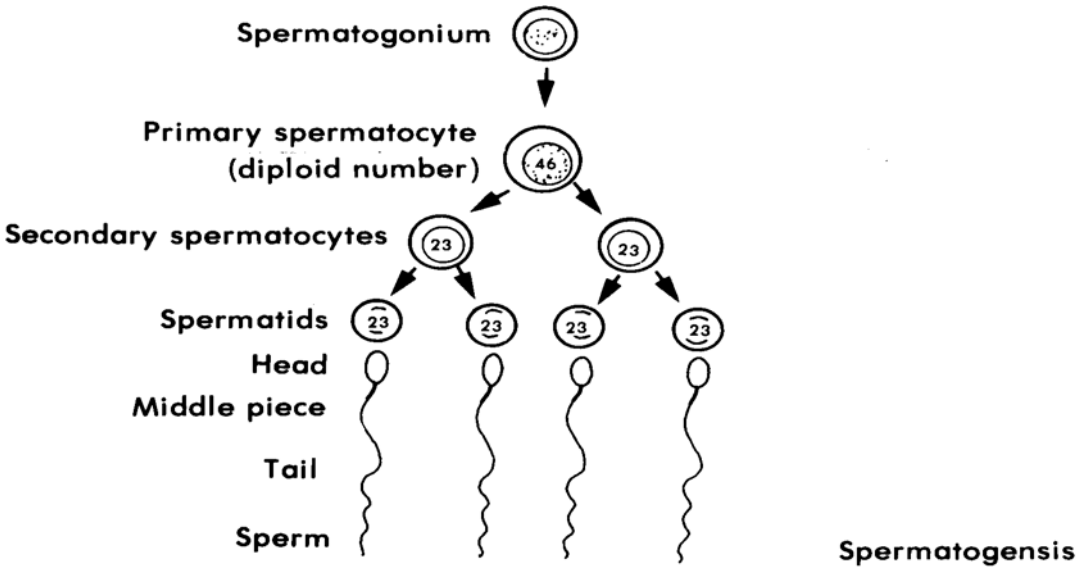


Figure 1-10. Spermatogenesis

c. The process is begun by primitive stem cells, which are called spermatogonia and are found in the outer region of each tubules. Follicle stimulating hormoneis secreted by the anterior pituitary beginning at puberty. Follicle stimulating hormoneis influences division of spermatogonia into primary spermatocytes.

d. Each spermatocyte undergoes meiosis and produces four spermatids. All of the male's body cells contain the same 23 pairs of chromosomes. The spermatid contains one chromosome of each of the 23 pairs. The same chromosome configuration occurs in the ovum. When the sperm and egg unite, the normal number of chromosomes is reestablished--46 chromosomes or 23 pairs.

e. The mature sperm contains three regions: the head, which contains deoxyribonucleic acid (DNA), the midpiece, and the tail (see figure 1-11).

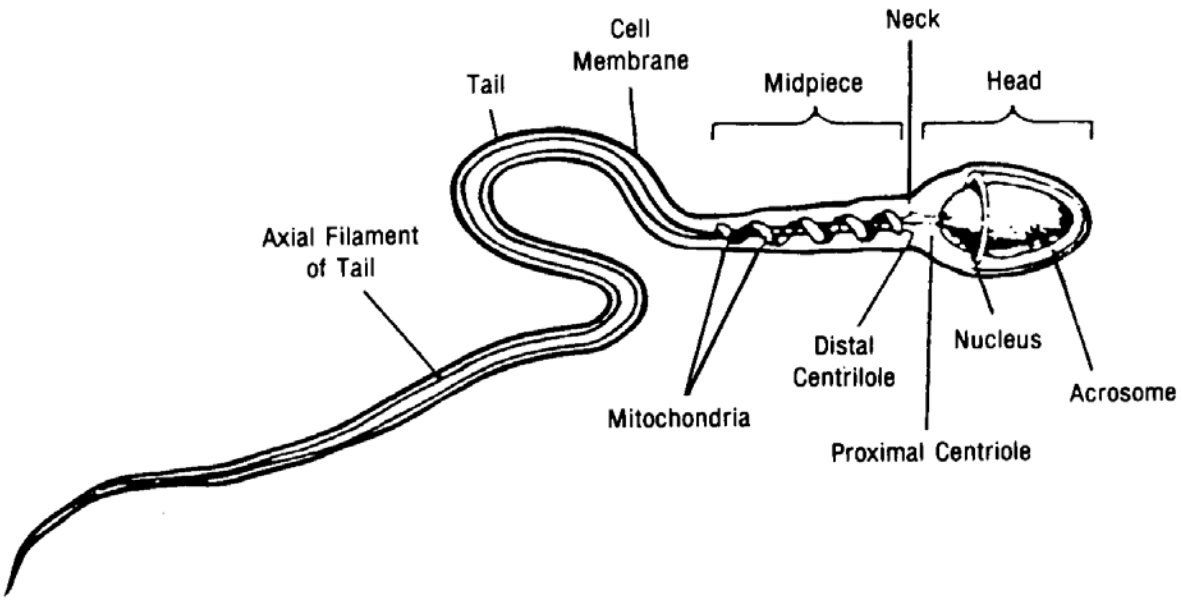


Figure 1-11. Structure of the sperm.

f. The acrosome is anterior to the head of the mature sperm. It contains special enzymes, which help the sperm to penetrate the egg.

1-12. PROCESS OF TESTOSTERONE PRODUCTION

The interstitial cells, which lie between the seminiferous tubules, produce testosterone. These cells are activated during puberty by two hormones, FSH and LH, which is called interstitial cell stimulating hormone (ICSH). A rise in testosterone production in the young male stimulates his reproductive organs to develop to their adult size and causes secondary sex characteristics to appear. These characteristics are:

a. Deepening of the voice due to enlargement of the larynx.

b. Increased hair growth especially on the face, axillary, and pubic regions.

c. Enlargement of skeletal muscles.

d. Increase in skeletal size.

Continue with Exercises

EXERCISES, LESSON 1

INSTRUCTIONS: Complete the following exercises by marking the lettered response that best answers the question, by completing the incomplete statement, or by writing the answer in the space(s) provided.

After you have completed all of these exercises, turn to "Solutions to Exercises" at the end of the lesson and check your answers. For each exercise answered incorrectly, reread the material referenced with the solution.

1. List the female's internal reproductive organs.

   _____. _____.

   _____. _____.

2. The _____ is suspended by broad ligaments and is located between the urinary bladder and the rectum.

3. The _____ provides the passageway for childbirth and menstrual flow.

4. The female has ____fallopian tubes.

   a. Two.

   b. Three.

   c. Four.

5. Which of the female reproductive organs has finger-like projections that partially surround each ovary?

   _____.

6. _____ are for the production of oogenesis and hormones.

7. _____ works with estrogen to produce a normal menstrual cycle.

8. Vaginal introitus is known as the _____.

9. Days 6-14 of the hormonal interaction of the female cycle is known as the _____ phase.

10. What is the name of the male's sex hormone?

    _____.

11. What male reproductive organ is suspended in the scrotal sac outside of the abdominopelvic cavity?

    _____

12. The _____ caps the superior part of the testes and runs down its posterior side.

13. The male's accessory glandular structure includes:

    _____. _____.

    _____. _____.

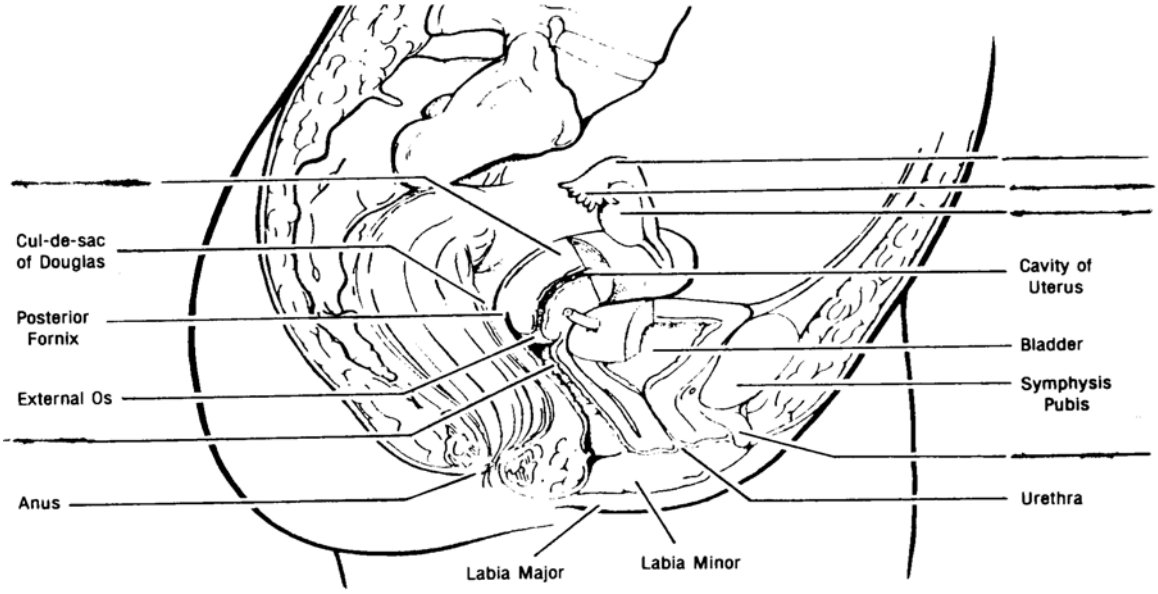
14. The _____ is anterior to the head of the mature sperm.

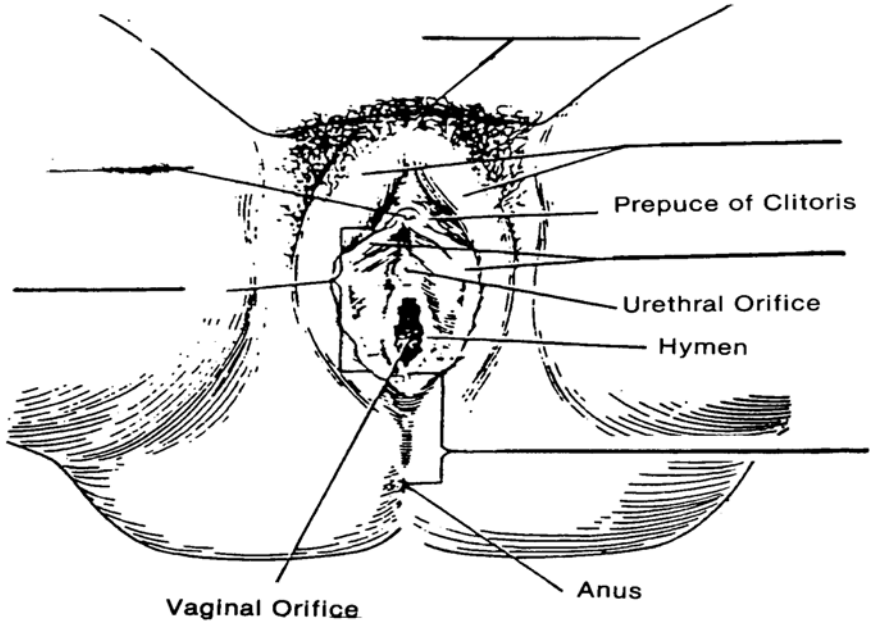
15. The male's interstitial cells are activated during puberty by two hormones, _____ and _____.

Special Instructions for Exercises 16 Through 32 (following page). Match the information in Column A with the appropriate word or term in Column B. Place the letter of the response in the blank space at the left of the number in Column A.

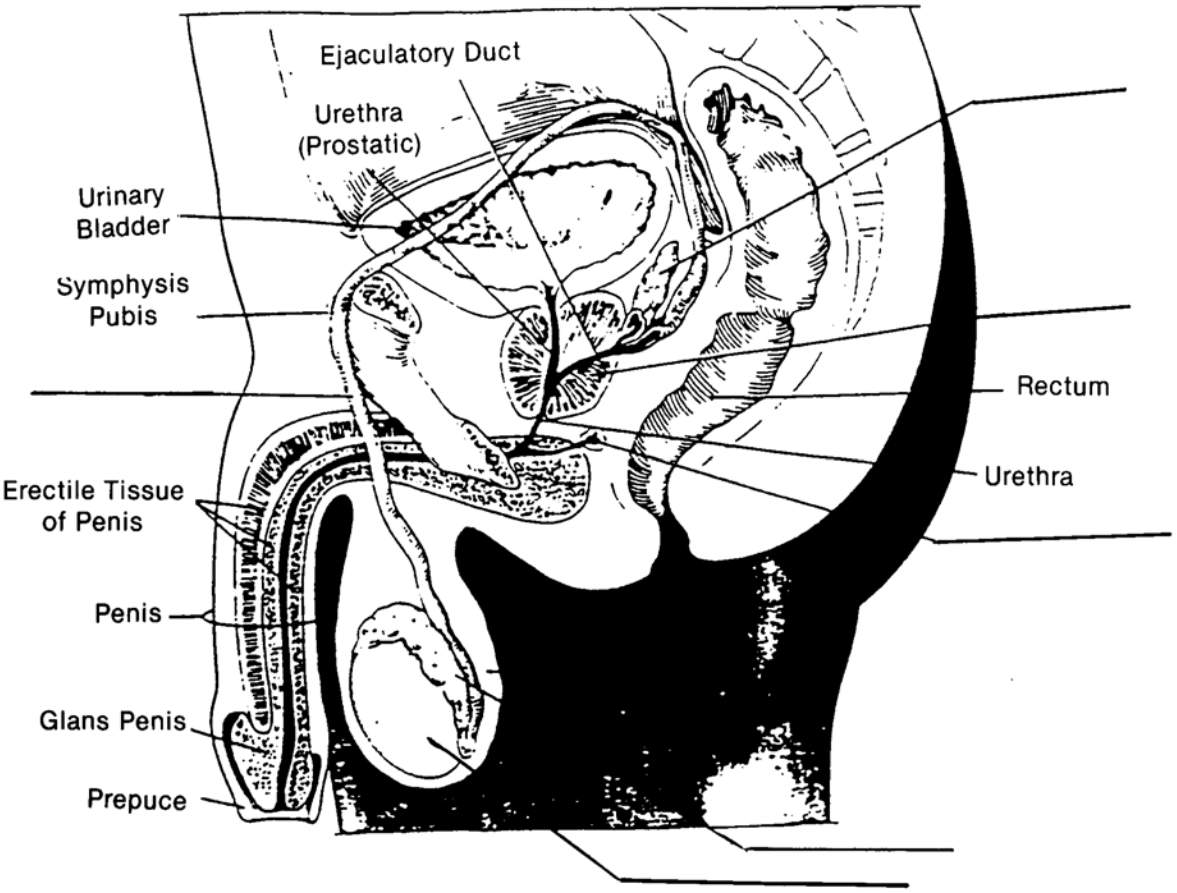
COLUMN A		COLUMN B
_____16.	Upon dividing 2 different cells are produced, each containing 23 chromosomes.	a. internal
_____17.	Menopause.	b. walls of the uterus
_____18.	Transport ovum from the ovaries to the uterus.	c. ovaries
_____19.	Epididymis and vas deferens.	d. divisions of the uterus
_____20.	Corpus, fundus, cervix, isthmus.	e. external female organs
_____21.	Pouches that store sperm.	f. menstrual cycle
_____22.	Ovaries, uterus, vagina, fallopian tubes. the female cycle	g. fallopian tubes
_____23.	Cowper's glands, penis, prostate, seminal vesicles.	h. primary oocyte
_____24.	Tail, midpiece, head.	i. hormonal interaction of
_____25.	Mons pubis, vestibule, perineum, Bartholin's glands.	j. menstruation cessation
_____26.	Menses phase, proliferative phase, secretory phase.	k. produces sperm and testosterone
_____27.	Peritoneum, myometrium, endometrium.	l. male's duct system
_____28.	Millions of sperms produced in the seminiferous tubules.	m. vestibule
_____29.	Controlled by the cyclic activity of FSH and LH.	n. accessory glandular structure
_____30.	Produces female sex eggs, estrogen, and progesterone.	o. seminal vesicles
_____31.	Testes.	p. spermatogenesis
_____32.	Clitoris, urethral meatus, vaginal introitus.	q. regions of a mature sperm

33. Identify each of the parts indicated in the drawings of the female's reproductive system below.





34. Identify each of the parts indicated in the drawing of the male's reproductive system below.



Check Your Answers on Next Page

SOLUTIONS TO EXERCISES, LESSON 1

1. uterus.
   vagina.
   fallopian tubes.
   ovaries (para 1-3).

2. uterus (para 1-3a(1)).

3. vagina (para 1-3b(2)).

4. a (para 1-3c).

5. fallopian tubes (para 1-3c(3)).

6. Ovaries (para 1-3d(1)).

7. Progesterone (para 1-3d(4)(b)).

8. vaginal entrance (para 1-4d(3)).

9. proliferative (para 1-6b(2)).

10. testosterone (para 1-9).

11. testes (para 1-10a).

12. epididymis (para 1-10b(1)).

13. seminal vesicles.
    prostate gland.
    Cowper's gland.
    penis (para 1-10c).

14. acrosome (para 1-11f).

15. FSH and LH (para 1-12)

16. h (para 1-3d(3)(c)).

17. j (para 1-8).

18. g (para 1-3c(2)).

19. l (para 1-10b).

20. d (para 1-3a(2)).

21. o (para 1-10c(1)).

22. a (para 1-3).

23. n (para 1-10c).

24. q (para 1-11e).

25. e (para 1-4).

26. l (para 1-6b).

27. b (para 1-3a(3)).

28. p (para 1-11b).

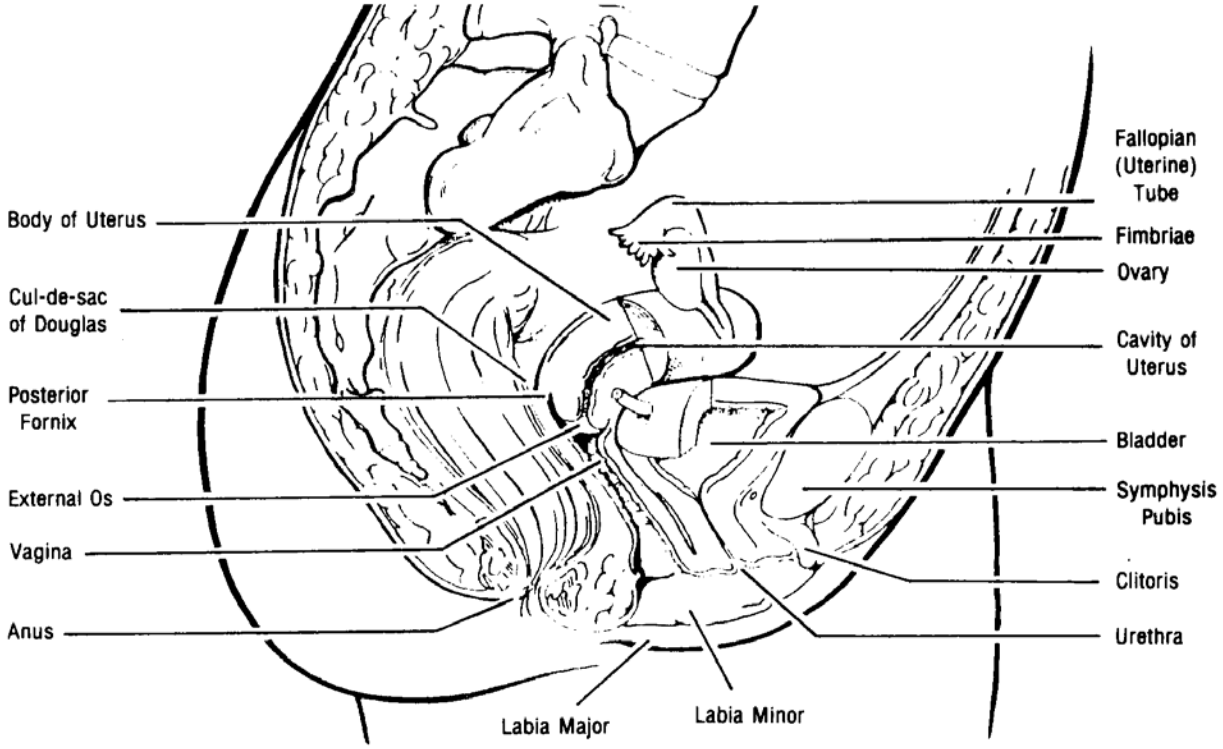
29. f (para 1-6a).

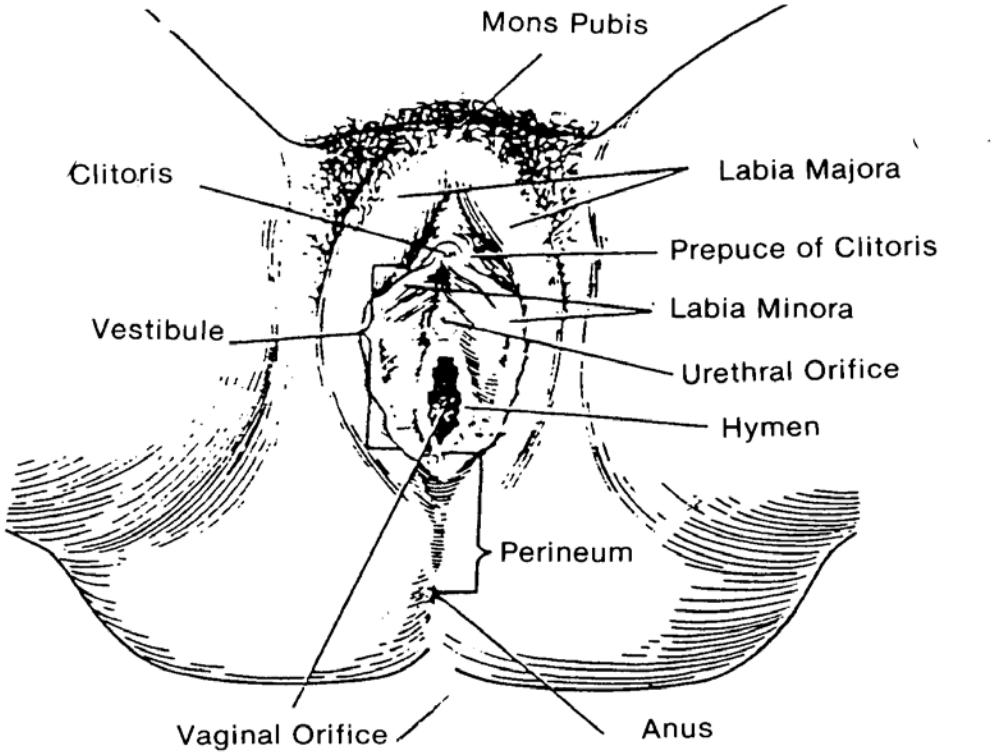
30. c (para 1-3d(1)).

31. k (para 1-10a).

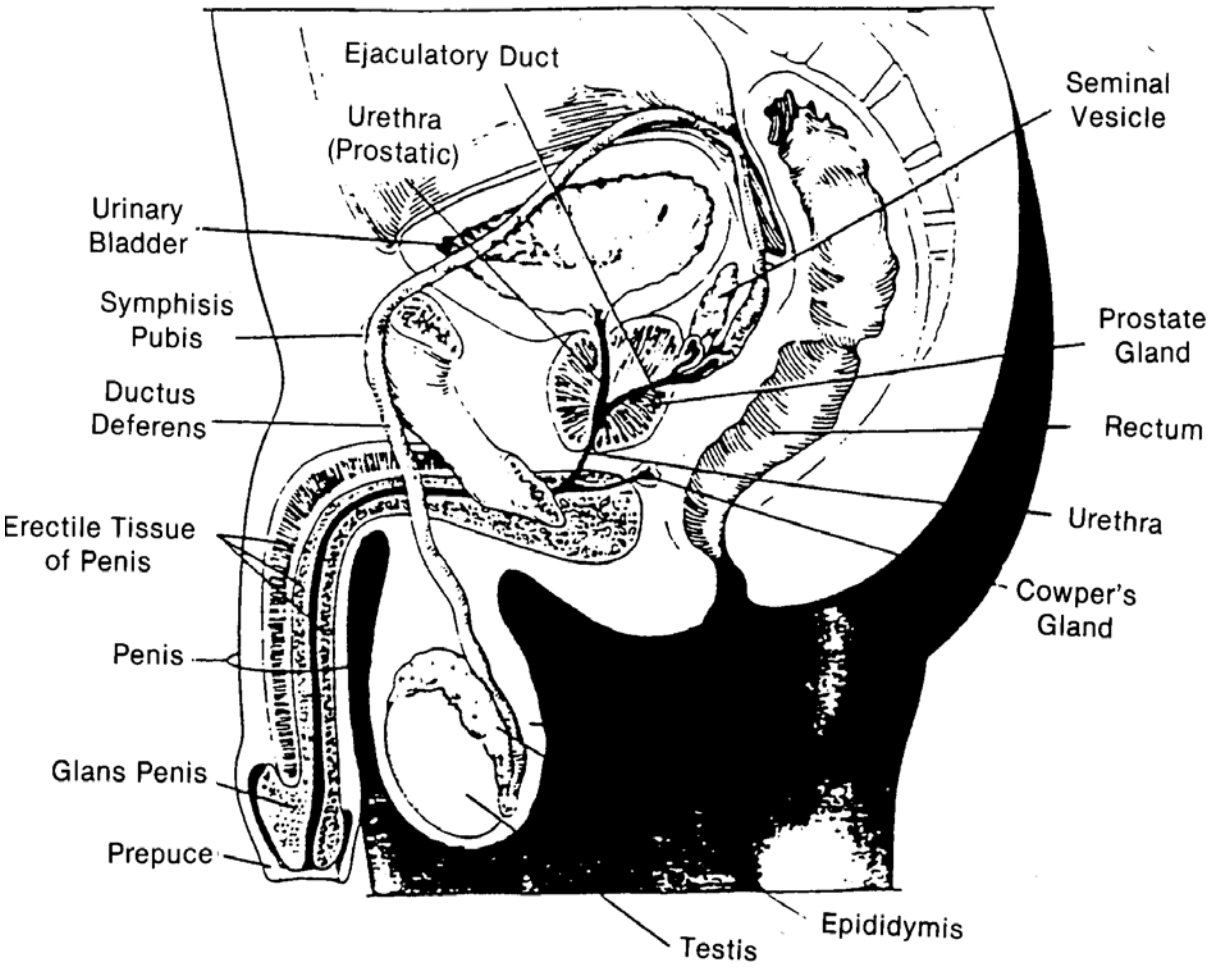
32. m (para 1-4d).

33. Solution for exercise #33 (female's reproductive organs).





34. Solution for exercise number 34 (male's reproductive organs).



End of Lesson 1

LESSON ASSIGNMENT

LESSON 2 Embryology and Fetal Development.

TEXT ASSIGNMENT Paragraphs 2-1 through 2-15.

LESSON OBJECTIVES After completing this lesson, you should be able to:

2-1. Identify terms and definitions that are related to embryology and fetal development.

2-2. Identify the principles of fertilization.

2-3. Identify statements referring to the process of implantation.

2-4. Select statements concerning sex determination.

2-5. Select descriptive statements referring to placenta development.

2-6. Identify the functions of the placenta.

2-7. Identify statements referring to fetal membranes.

2-8. Identify fetal development at the end of each trimester.

2-9. Identify the normal duration of a pregnancy.

2-10. Select statements giving information about what is obtained by an amniocentesis.

2-11. Identify risks of an amniocentesis.

2-12. Identify components of fetal circulation.

2-13. Identify changes in fetal circulation after birth.

2-14. Select six diseases from which the fetus received temporary protection.

2-15. Identify identical and fraternal twins.

SUGGESTION After studying the assignment, complete the exercises at the end of this lesson. These exercises will help you to achieve the lesson objectives.

LESSON 2

EMBRYOLOGY AND FETAL DEVELOPMENT

2-1. GENERAL

Pregnancy is a sequence of events that normally includes fertilization, implantation, embryonic growth, and fetal growth that terminates in birth (see figure 2-1). Even though there are many events that take place in the reproductive cycle, we cannot include every detail in this lesson. However, the following information will give descriptive events of what goes on in the uterus prior to birth. This information will also help you to recognize potential problems and to be able to intervene in the nursing care process.

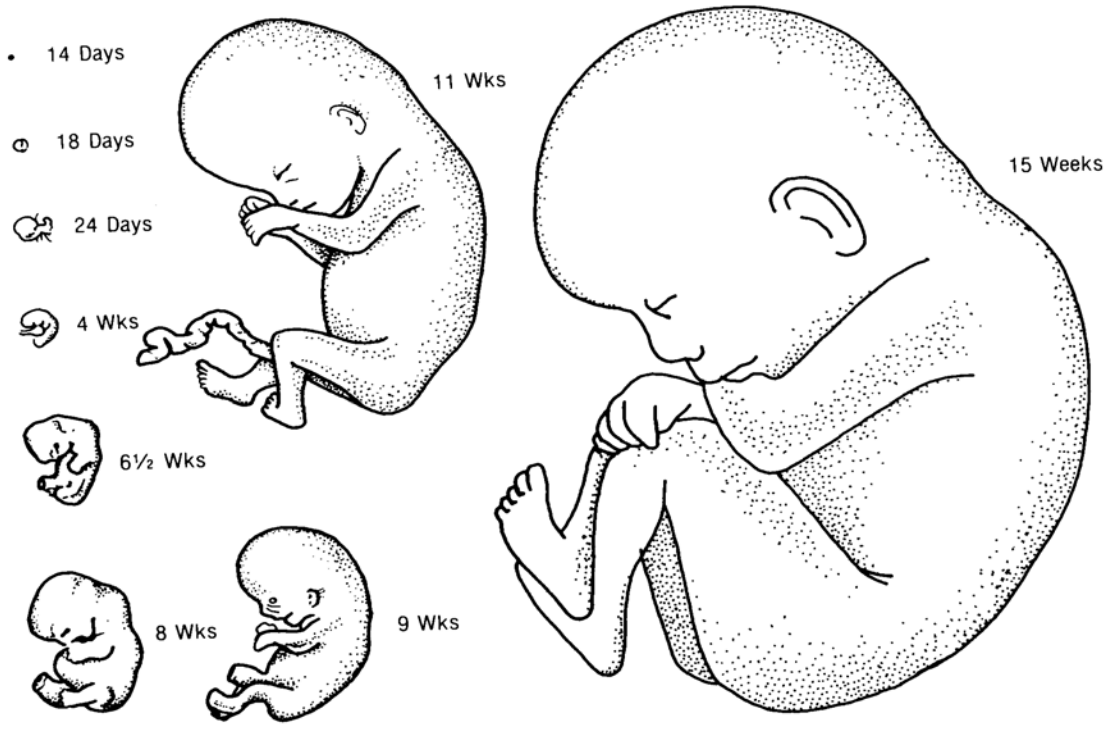


Figure 2-1. Growth of the fetus.

2-2. PRINCIPLES OF FERTILIZATION (CONCEPTION)

a. Fertilization refers to the joining together of the ovum (egg) and sperm cells. The ovum originates in the graafian follicle within the ovary. The sperm cell originates in the testes. The microscopic union of sperm and ovum increase in size more than 20 billion times from conception to birth. See figure 2-2 for union of sperm and ovum.

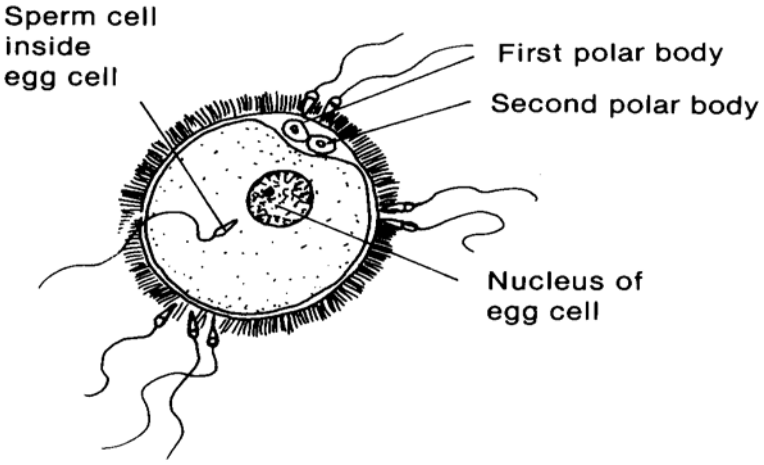


Figure 2-2. Sperm and ovum.

b. During sexual intercourse, 2 to 5 ml of semen, usually containing more than 300 million sperm, is ejaculated into the female's vagina. By flagellar (wiggly) movement, the sperm make their way through the fluids of the cervical mucous, across the endometrium, and into the fallopian tube to meet the descending ovum in the ampulla of the fallopian tube (see figure 2-3). Only one sperm is required for actual fertilization, but the presence of many increases the chances for one to penetrate. The union between ovum and sperm occurs in the outer third of the fallopian tube.

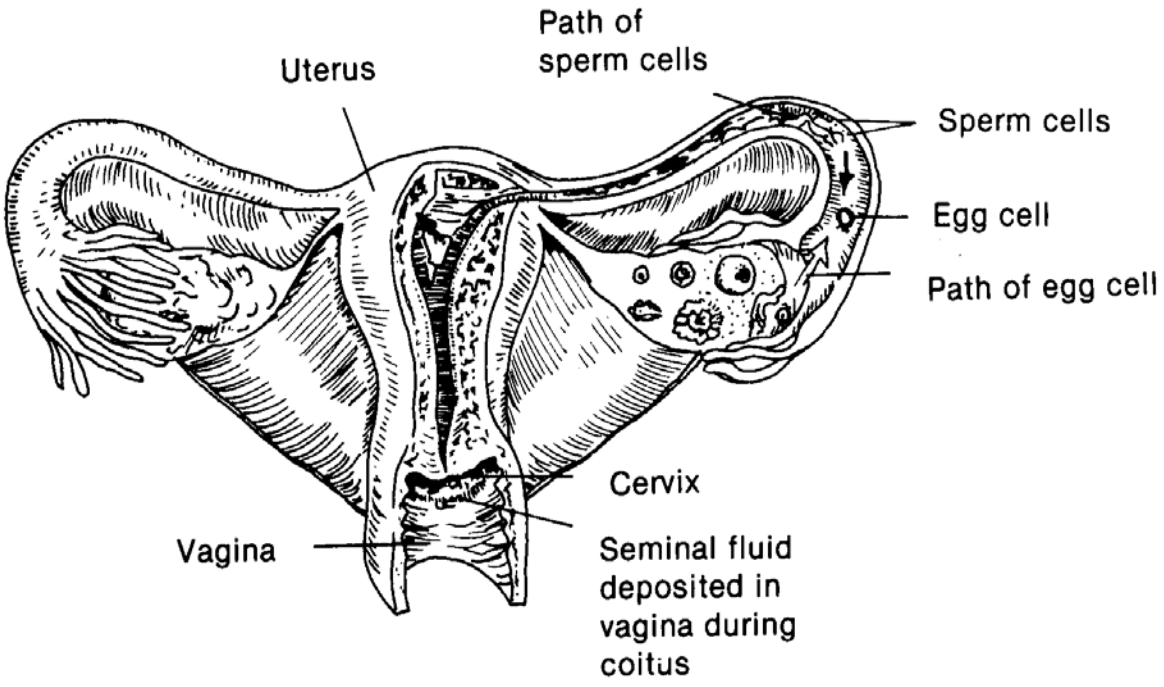


Figure 2-3. Travel of sperm to ovum.

c. The combined ovum and sperm, referred to as the zygote, begins rapid cell division and in 2 to 3 days becomes a structure referred to as morula. The morula is a rapidly growing structure and reaches the uterus in approximately 4 days.

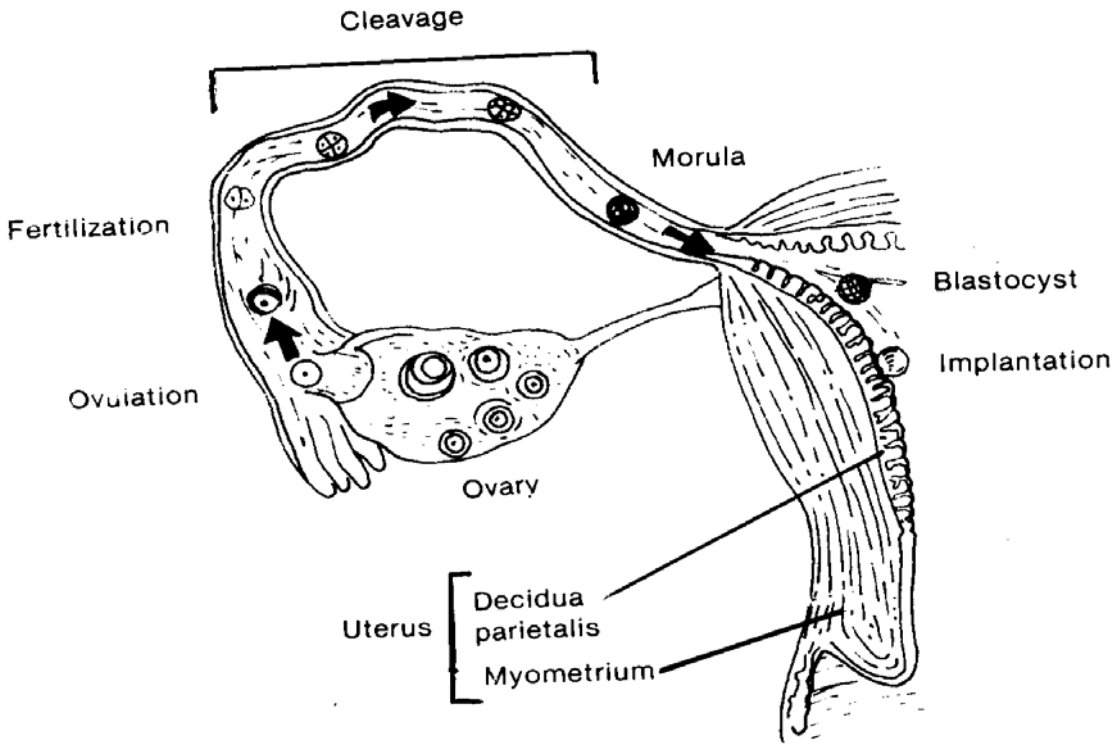
2-3. PROCESS OF IMPLANTATION

a. The morula floats in the uterus for 3 to 4 days, gaining in size and weight. At this time, the hollow fluid-filled morula, now called blastocyst burrows into the uterine lining.

b. The outer surface of the blastocyst becomes covered with finger-like projections called chorionic villi. Chorionic villi aid in the process of implantation into the endometrium (decidua). Villi also manufacture human chorionic gonadotropin (HCG) which signal the corpus luteum within the ovaries to continue production of progesterone and estrogen to prevent menstruation.

c. Implantation normally occurs in the upper, posterior wall of the uterus. The point of implantation becomes the origin for the placenta and umbilical cord.

NOTE: See figure 2-4 for associated events of fertilization and implantation.



2-4. Events of fertilization and implantation.

2-4. SEX DETERMINATION

Chromosomes are small, threadlike structures within each cell that contain genes, which carry genetic instructions. These genes control the physical and chemical traits inherited by children from their parents. The inherited traits are color of the eyes, sex, height, and skin color.

a. The female has 23 pairs of chromosomes. The pair of chromosomes that determined her sex are named "XX." The ovum carries one chromosome from each of the female's pairs (23 chromosomes). The ovum can only carry an "X" sex chromosome.

b. The male has 23 pairs of chromosomes. The pair of chromosomes that determined his sex are named "XY." The sperm carries one chromosome from each of the male's pairs (23 chromosomes). The sperm can carry either an "X" or a "Y" sex chromosome.

c. If the ovum is fertilized by a sperm carrying an "X" chromosome, the child is a girl.

d. If the ovum is fertilized by a sperm carrying a "Y" chromosome, the child is a boy.

e. The sperm of the father always determines the child's sex (see figure 2-5).

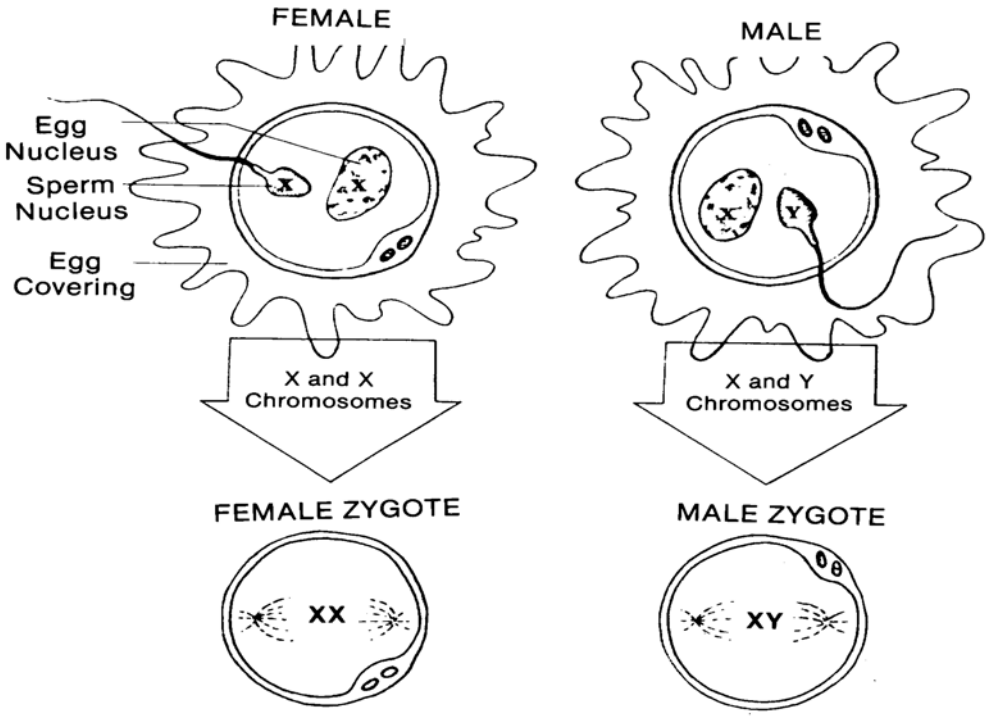


Figure 2-5. Genetic determination of sex.

2-5. PLACENTAL DEVELOPMENT

The placenta is a fleshy disk like organ. The fully developed placenta (afterbirth) is reddish in color. It is formed from the outer layers of the blastocyst. It is completely formed by the third month of pregnancy. The umbilical cord (lifeline) connects the fetus to the placenta and is normally 20 inches in length and 3/4 inch in diameter. It contains one umbilical vein and two umbilical arteries.

2-6. FUNCTIONS OF THE PLACENTA

Being knowledgeable of the placenta functions gives insight into prenatal life and is helpful in providing nursing care to the unborn and the newborn. The placenta functions as a transport mechanism between the embryo and the mother (see figure 2-6). The placenta has many tasks: it transports oxygen, nutrients, and antibodies to the fetus by means of the umbilical vein; removes carbon dioxide and metabolic wastes from the fetus by the two umbilical arteries; serves as a protective barrier against harmful effects of certain drugs and microorganisms; acts as a partial barrier between the mother and fetus to prevent fetal and maternal blood from mixing; and produces hormones essential for maintaining the pregnancy. (The hormones are estrogen, progesterone, and human chorionic gonadotropin (HCG)).

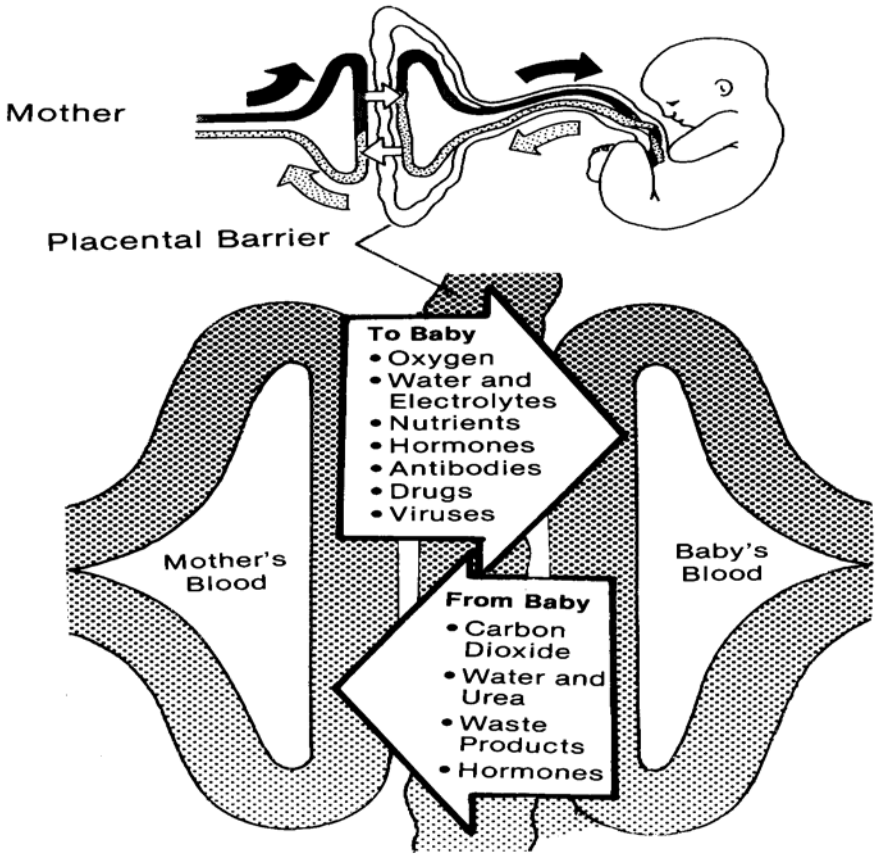


Figure 2-6. The placental circulation.

2-7. FETAL MEMBRANES

Two closely applied but separate membranes line the uterine cavity and surround the developing embryo-fetus. Both membranes, the amnion (inner membrane) and the chorion (outer membrane), arise from the zygote. As the chorion develops, it blends with the fetal portion of the placenta; the amnion blends with the fetal umbilical cord. These deceptively strong, translucent membranes contain not only the fetus but also the amniotic fluid, and they are continuous with the margins of the placenta. See figure 2-7.

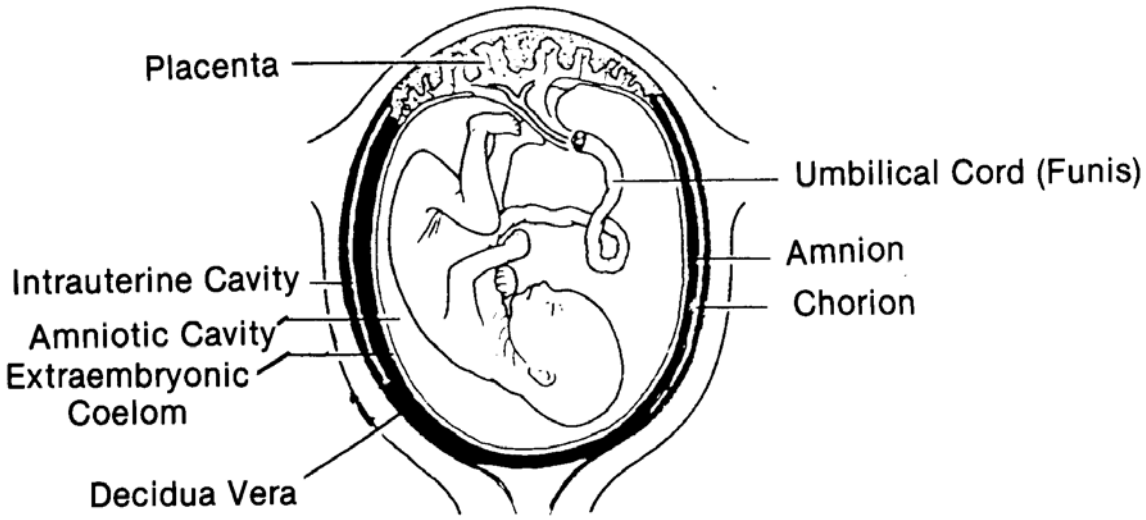


Figure 2-7. Fetal membranes.

a. **Amnion.** This is the smooth, slippery, glistening innermost membrane that lines the amniotic space. It is filled with fluid and is often called the "bag of water." The fetus floats and moves in the amniotic cavity. At full term, this cavity normally contains 500 cc to 1000 cc of fluid (water). This fluid provides many functions for the fetus. The amnion usually ruptures just before birth. The amnion functions to:

(1) Protect the fetus from direct trauma by distributing and equalizing any impact the mother may receive.

(2) Separate the fetus from the fetal membranes.

(3) Allow freedom of fetal movement and permits musculoskeletal development.

(4) Facilitate symmetric growth and development of the fetus.

(5) Protect the fetus from the loss of heat and maintains a relative, constant fetal body temperature.

(6) Serve as a source of oral fluid for the fetus.

(7) Act as an excretion and collection system.

b. **Chorion.** This is the outer membrane. It forms a large portion of the connective tissue thickness of the placenta on its fetal side. It is the structure in and through which the major branching umbilical vessels travel on the surface of the placenta.

2-8. FETAL GROWTH AND DEVELOPMENT

Growth refers to an increase in size. Development is the continuous process by which an individual changes from one life phase to another. These phases includes the prenatal period and the postnatal period. Fetal maturation takes place in an orderly and predictable pattern. The physicians refer to the age of a pregnancy as lunar months. The lunar months corresponds to the usual length of the menstrual cycle, in this respect, it is easier to calculate. A lunar month is a period of four weeks (28 days) and a trimester is a time period of 3 months.

a. **First Trimester.** During the first three months of pregnancy, the product of conception grows from the just-visible speck to the fertilized ovum to a lively embryo. At the end of the first trimester, the following changes have or are occurring:

(1) All organs are formed.

(2) The fetus becomes less vulnerable to the effects of most drugs, most infections, and radiation.

(3) Facial features are forming and the fetus becomes human in appearance.

(4) External sex organs are visible, but positive sex identification is difficult.

(5) Well-defined neck, nail beds beginning, and tooth buds form.

(6) Rudimentary kidneys excrete small amounts of urine into the amniotic sac.

(7) There is movement but just not strong enough to be felt.

(8) The fetus is about 2.9 inches long and weighs about 14 grams.

b. **Second Trimester.** During these months (4th, 5th, and 6th) the fetus grows fast. At the end of the second trimester, the fetus:

(1) Fetal heart tone (FHT) can be heard with a stethoscope.

(2) Skin is wrinkled, translucent, and appears pink.

(3) Sex is obvious.

(4) Looks like a miniature baby.

(5) Skeleton is calcified.

(6) Birth survival is possible, but the fetus is seriously at risk.

c. **Third Trimester.** At the end of the third trimester (7th, 8th, and 9th month), the fetus:

(1) Skin is whitish pink.

(2) Hair in single strands.

(3) Testes are in the scrotum, if a male child.

(4) Bones of the skull are firmer, comes closer at the suture lines.

(5) Lightening occurs.

(6) Fetus is about 20 inches long and weighs about 3300 grams.

NOTE: Lightening is defined as the sensation of decreased abdominal distention produced by the descent of the uterus into the pelvic cavity. This usually occurs two weeks before the onset of labor.

2-9. DURATION OF PREGNANCY

a. The length of pregnancy varies greatly. Nevertheless, the normal duration of pregnancy is about 9 1/2 to 10 months (lunar), 38 to 40 weeks.

b. It is usually not possible to determine the actual time of fertilization because reliable records concerning sexual activities are seldom available. However, the approximate time can be calculated.

c. The estimated date of confinement (EDC) is calculated as follows:

(1) The first day of last menstrual period.

(2) Count back 3 months.

(3) Add seven days.

(4) Add one year.

2-10. ASSESSING FETAL MATURITY AND WELL-BEING

Indications for assessing fetal maturity includes: determining the appropriate time for inducing labor, avoiding prematurity, and guarding the high-risk mother. Varieties of tests of the fetus status are of value in monitoring the well being of the fetus. Evaluation of fetal maturity and well-being is essential in the management of the high-risk pregnancy. The following test may be used:

a. **Amniocentesis.** A method for assessing fetal maturity and well being.

(1) Definition. Amniocentesis is withdrawal of amniotic fluid by insertion of a needle through the abdominal and uterine walls (see figure 2-8).

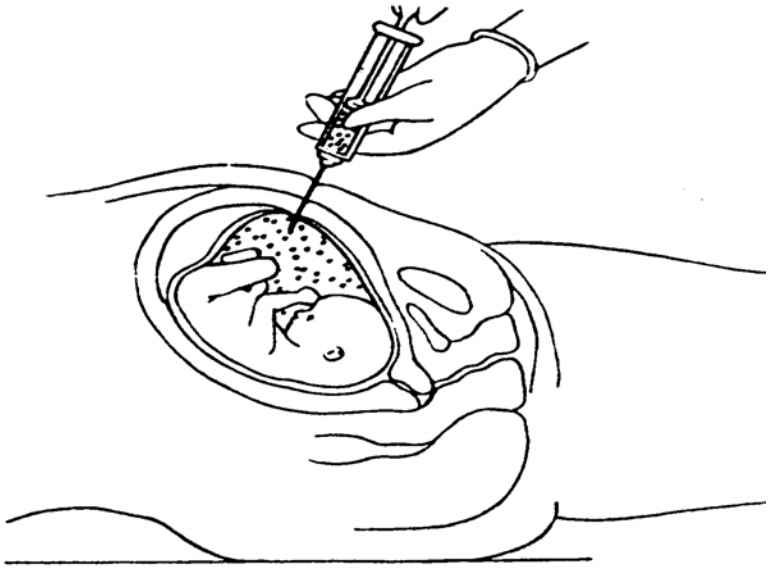


Figure 2-8. Amniocentesis.

(2) When done. This procedure is possible after the 14th week of pregnancy when the uterus becomes an abdominal organ and when there is sufficient fluid for the procedure.

(3) Information obtained by amniocentesis.

(a) Color of fluid. The fluid is usually colorless. If it is meconium (stool) stained, it will be greenish brown and this indicates fetal hypoxia.

(b) Detects fetal chromosomal anomalies such as Down's Syndrome.

(c) Helps to evaluate the probability of sex-linked genetic disorders.

(d) Indicates fetal maturity, in-born errors, or metabolism, (indicates disorders like PKU).

(4) Risks of the procedure. Overall complications are less than 1percent for the mother and the fetus. Possible risks are:

(a) Maternal.

1 Hemorrhage.

2 Infection.

3 Labor.

4 Inadvertent damage to the intestines or bladder.

(b) Fetal.

1 Death.

2 Hemorrhage.

3 Direct injury from the needle.

4 Abortion.

5 Premature labor.

b. **Non-Stress Test.** It evaluates the ability of the placenta to supply fetal needs in a normal (or unstressed) daily uterine environment.

(1) The non-stress test (NST) involves application of the fetal monitor to record the fetal heart rate. The mother is instructed to push a marker button when she feels the fetus move. The marker button indicates movement as it occurred in relationship to the fetal heart rate. With sufficient placental functioning, the fetus should demonstrate an acceleration in heart rate with movement, in the same way that the adult experiences increased heart rate with exercises. A lack of fetal heart rate acceleration indicates the need for further testing.

(2) Non-stress test is used to screen the high-risk pregnancy where the placental compromise is anticipated to include post-term pregnancy, pregnancy induced hypertension, gestational diabetes, intrauterine growth retardation, and maternal complaints of decreased fetal movement.

(3) Patients identified as NST candidates will generally be required to complete an NST on a regular basis (that is, weekly, bi-weekly).

c. **Methods of Contraction Production.**

(1) Oxytocin challenge test (OCT). A dilute of IV solution of oxytocin is administered to the mother until a contraction pattern is developed. When sufficient information is obtained to evaluate the test, the medication is turned off.

(a) The Oxytocin challenge test evaluates the ability of the placenta to supply fetal needs in a stressed environment. Contractions, such as those of labor, are a stress on the pregnancy. During a contraction, the flow of oxygen from the uterus to the placenta is diminished. The healthy placenta stores an oxygen reserve so that the fetus does not suffer a diminished supply of oxygen during the contraction.

(b) The OCT involves application of the fetal monitor to record fetal heart rate and contraction activity. Acceptable results include acceleration of fetal heart rate or no change in fetal heart rate baseline during a contraction. Unacceptable results include deceleration of fetal heart rate during a contraction.

(c) The OCT is used to evaluate the high-risk pregnancy where the placental compromise is suspected. It is often applied to the same high-risk patients listed under NST. In addition, it is used to evaluate the patient when a suspicious result is obtained on an NST. The OCT is more invasive than the NST; it provides more conclusive results than the NST.

(2) Breast stimulation test (BST). This test involves stimulation of the nipples (by rubbing), which causes the posterior pituitary to release the hormone oxytocin, which in turn, causes contractions.

(3) Contraction stress test (CST). Evaluation is done in the presence of naturally occurring contractions. It is a means of evaluating the respiratory function (oxygen and carbon dioxide exchange) in the placenta.

2-11. COMPONENTS OF FETAL CIRCULATION

As the placenta acts as the intermediary organ of transfer between the mother and fetus, fetal circulation differs from that required for extrauterine existence. The fetus receives oxygen through the placenta because the lungs do not function as organs of respiration in the uterus. To meet this situation, the fetal circulation contains certain special vessels that shunt the blood around the lungs, with only a small amount circulating through them for nutrition. See figure 2-9. The following functions occurs:

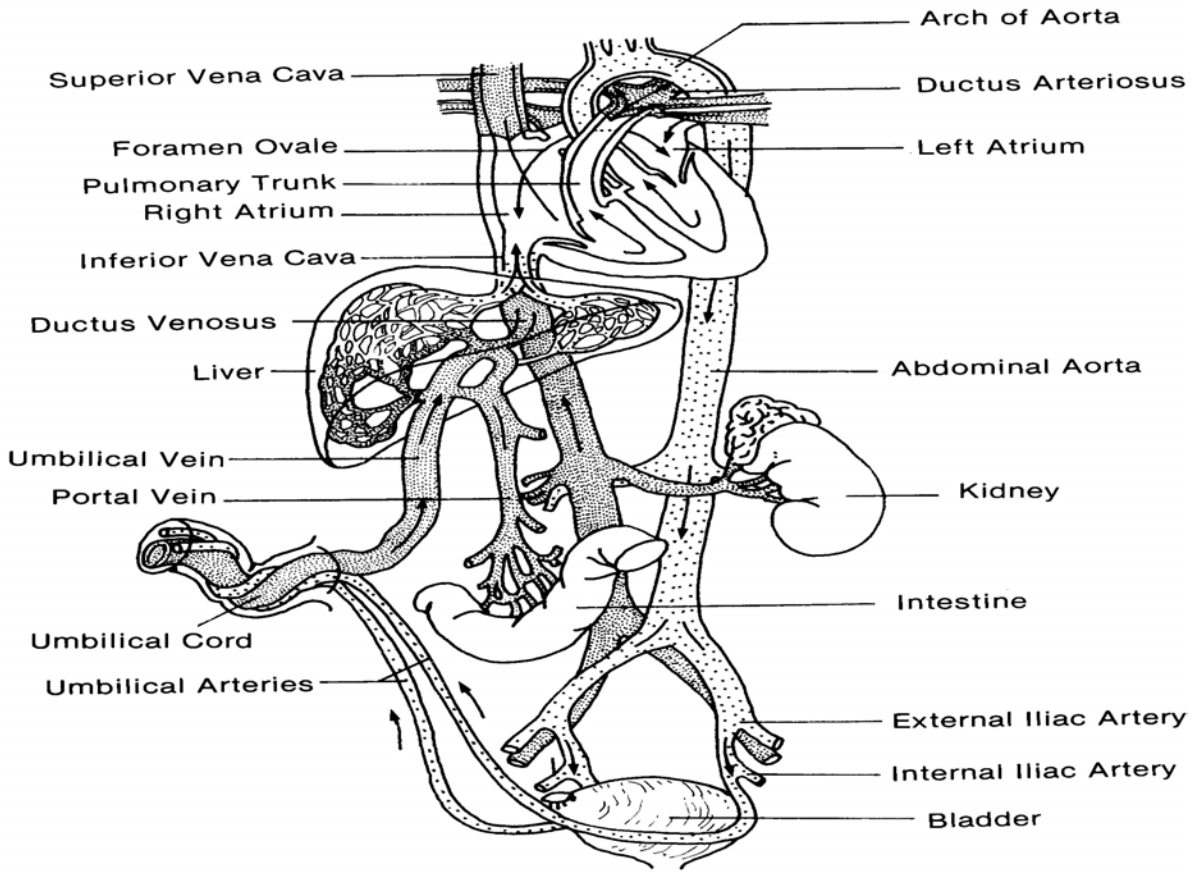


Figure 2-9. Fetal circulation before birth.

a. The umbilical vein transports blood rich in oxygen and nutrients from the placenta to the fetal body. This vein travels along the anterior abdominal wall of the fetus to the liver, and at the porta hepatis, the umbilical vein divides into two branches.

b. About 1/2 of the blood passes into the liver and the rest enters a shunting vessel called the ductus venosus that bypasses the liver. The ductus venosus travels a short distance and joins the inferior vena cava.

c. There, the oxygenated blood from the placenta is mixed with deoxygenated blood from the lower parts of the fetal body. This blood continues through the vena cava to the right atrium.

d. As the blood relatively high in oxygen enters the right atrium of the fetal heart, a large proportion of it is shunted directly into the left atrium through an opening in the atrial septum called the foramen ovale.

e. The more highly oxygenated blood that enters the left atrium through the foramen ovale is mixed with a small amount of deoxygenated blood returning from the pulmonary veins. This mixture moves into the left ventricle and is pumped into the aorta.

f. Some of this blood reaches the myocardium by means of the coronary arteries and some reaches the tissues of the brain through the carotid arteries.

g. The rest of the blood entering the right atrium, as well as the large proportion of the deoxygenated blood entering from the superior vena cava, passes into the right ventricle and out through the pulmonary artery.

h. Enough blood reaches the lung tissues to sustain them.

i. Most of the blood in the pulmonary artery bypasses the lungs by entering the ductus arteriosus, which connects the pulmonary artery to the descending portion of the aortic arch.

j. Some of the blood carried by the descending aorta leads to the various parts in the lower regions of the body.

k. The rest of the blood passes into the umbilical arteries which branch from the internal iliac arteries and lead to the placenta.

2-12. CHANGES CONTINUE IN CIRCULATION AFTER BIRTH

See figure 2-10.

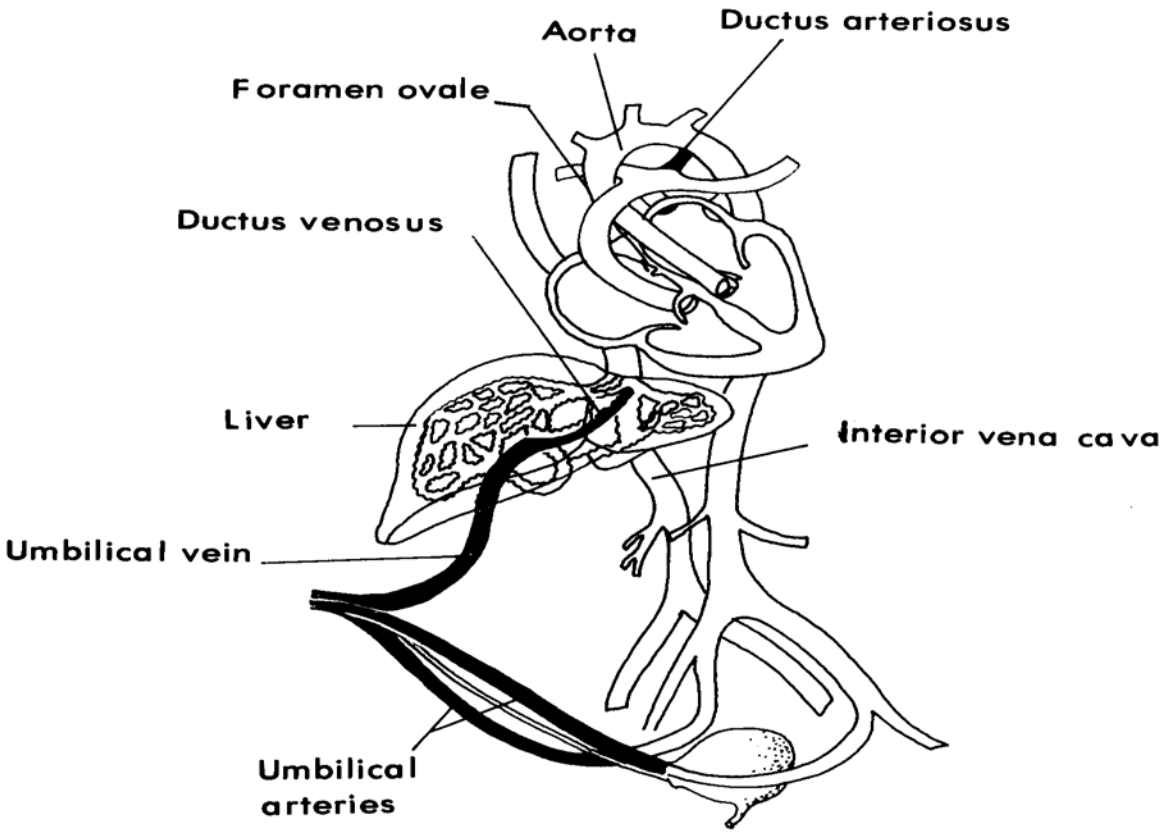


Figure 2-10. Fetal circulation after birth.

a. The umbilical vein is obliterated and becomes the round ligament of the liver.

b. The umbilical arteries are obliterated and ultimately become ligaments.

c. The ductus venosus is obliterated and becomes a ligament. Anatomic closure is completed at the end of 2 months. The ductus venosus is superficially embedded in the wall of the liver.

d. The ductus arteriosus is obliterated and becomes a ligament. Functional closure takes 3-4 days; anatomic closure is completed by 3 weeks. The constriction seems to be stimulated by a substance called Bradykinin, which is released from the lungs during their initial expansions.

e. The foramen ovale closes after the umbilical cord is tied and cut. A large amount of blood is returned to the heart and the lungs. With the lungs now functioning, there is equal pressure on both atria as the vessels constrict. Failure of the foramen ovale to close spontaneously results in an atrial septal defect, which may or may not require surgery later.

2-13. PRINCIPLES OF FETAL IMMUNOLOGY

a. During the third trimester, passive immunity to some diseases is provided by the mother.

b. Diseases that the fetus receives temporary protection from include:

(1) Rubella.

(2) Diphtheria.

(3) Measles.

(4) Poliomyelitis.

(5) Tetanus.

(6) Mumps.

c. Passive immunity is short term and infants must begin immunization against the above diseases by the age of 2 months.

2-14. MULTI-FETAL PREGNANCIES

a. Multi-fetal pregnancy is a pregnancy involving two or more fetuses.

b. Twin fetuses may originate several ways (see figure 2-11).

(1) Identical twins (monozygotic) originate from the same ovum and are always of the same sex. They share a single placenta.

(2) Fraternal twins (dizygotic) originates from two separate ova and sperm and may be of different sexes. They each have their own placenta.

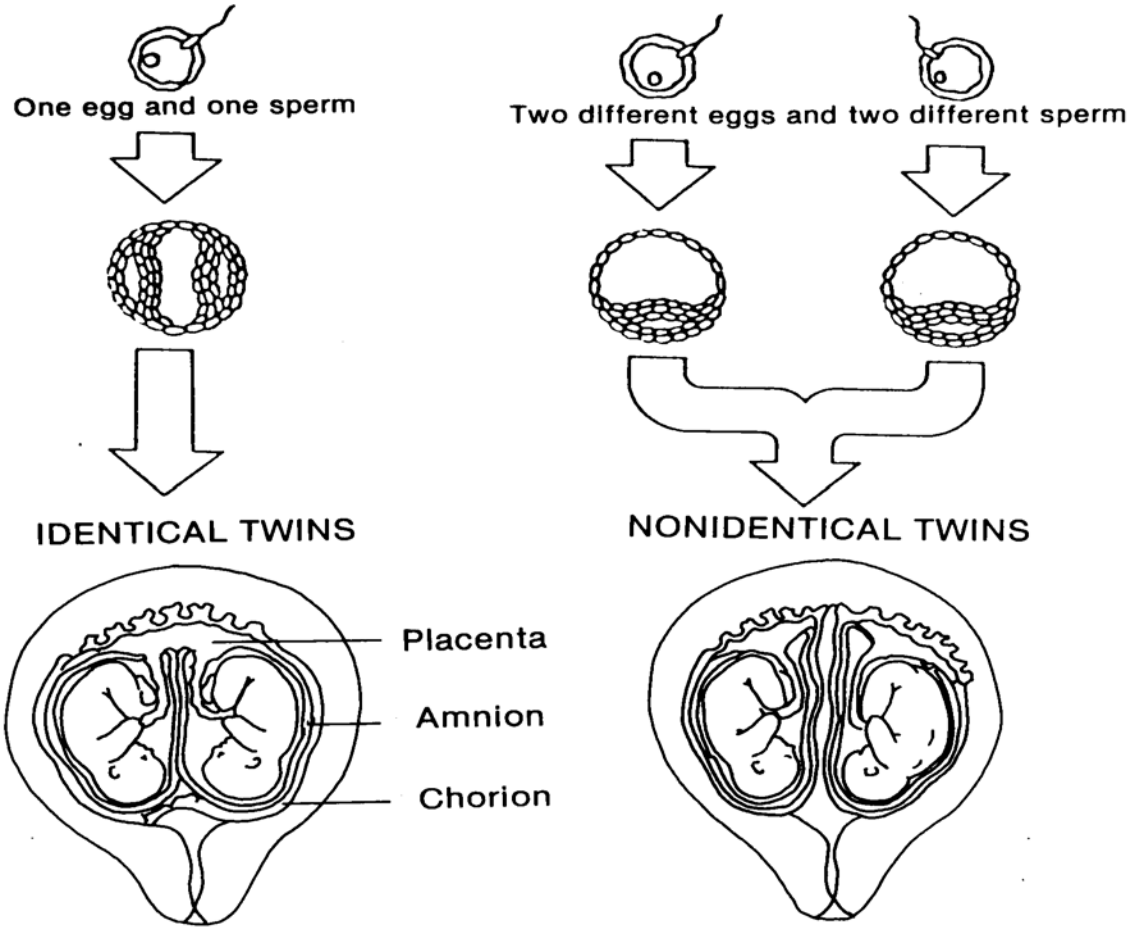


Figure 2-11. Development of twin fetuses.

c. Pregnancies involving more than two fetuses (that is, triplets, quadruplets) may occur by either situation.

(1) Monozygotic--all will be identical.

(2) Multi-zygotic--often associated with fertility drugs in which the ovary matured and released many eggs in the same cycle.

2-15. CLOSING

In closing, a working knowledge of the development of the human baby from conception to birth is essential for you to function effectively as a practical nurse. The information covered in this lesson, along with Lesson 1, will help you in carrying out the nursing process in labor and delivery, and caring for the newborn infant.

Continue with Exercises

EXERCISES, LESSON 2

INSTRUCTIONS: Answer the following exercises by marking the lettered response that best answers the exercise, by completing the incomplete statement, or by writing the answer in the space(s) provided.

After you have completed all of these exercises, turn to "Solutions to Exercises" at the end of the lesson and check your answers. For each exercise answered incorrectly, reread the material referenced with the solution.

1. Of the two fetal membranes, which one is the smooth, slippery, glistening innermost membrane that lines the amniotic space?

   _____

2. How long (number of months) is a trimester? _____

3. Lightening occurs during the _____trimester.

4. What is the normal duration of pregnancy? _____

5. What tests are used to assess fetal maturity and well-being?

   _____

   _____

   _____

   _____

   _____

6. Possible maternal risk of the amniocentesis includes:

   _____

   _____

For exercises 7 through 16. Use the following terms to complete the sentences or statements.

fertilization	pregnancy
zygote	multizygotic
placenta	chorion
lunar month	fraternal twins
identical twins	growth
monozygotic	

7. _____ originate from the same ovum and are always of the same sex.

8. An increase in size is known as _____.

9. The _____ is the outer membrane of the two fetal membranes.

10. The _____ is a fleshy disklike organ.

11. The combined ovum and sperm. _____.

12. A sequence of events that normally includes fertilization, implantation, embryonic growth, and fetal growth that terminates in birth. _____.

13. The joining together of the ovum and sperm cells is referred to as _____.

14. A period of four weeks (28 days). _____

15. The result of pregnancies involving two or more fetuses is known as _____ and _____.

16. Twins from two separate ova and sperm and may be of different sexes. _____

17. During the third trimester, passive immunity to some diseases is provided by the mother. The fetus receives temporary protection from the following diseases:

_____

_____

_____

_____

_____

_____

18. What changes occur in circulation after birth to the following parts?

Umbilical vein -_____

Ductus venosus - _____

Umbilical arteries - _____

Foramen ovale - _____

Ductus arteriosus -

19. The _____ acts as the intermediary organ of transfer between the mother and the fetus.

20. How does the fetus receive oxygen? _____

Check Your Answers on Next Page

SOLUTIONS TO EXERCISES, LESSON 2

1. amnion (para 2-7a).

2. 3 months (para 2-8).

3. 3rd (para 2-8c(5)).

4. 9 1/2 to 10 months (para 2-9a).

5. Amniocentesis.
   Non-stress test.
   Oxytocin challenge test.
   Breast stimulation test.
   Contraction stress test (paras 2-10a, b, and c).

6. hemorrhage.
   Infection.
   Labor.
   inadvertent damage to the intestines or bladder (para 2-10a(4)(a)).

7 . identical twins (para 2-14b(1)).

8. growth (para 2-8).

9. chorion (para 2-7b).

10. placenta (para 2-5).

11. zygote (para 2-2c).

12. pregnancy (para 2-1).

13. fertilization (para 2-2a).

14. lunar month (para 2-8).

15. monozygotic
    multi-zygotic (para 2-14c).

16. fraternal twins (para 2-14b(2)).

17. rubella.
Diphtheria.
Measles.
Poliomyelitis.
Tetanus.
mumps (para 2-13b).

18. Umbilical vein--is obliterated and becomes the round ligament of the liver.

Ductus venosus--is obliterated and becomes a ligament.

Umbilical arteries--are obliterated and ultimately becomes ligaments.

Foramen ovale--closes after birth, after the umbilical cord is tied and cut.

Ductus arteriosus--is obliterated and becomes a ligament. (para 2-12).

19. placenta (para 2-11).

20. through the placenta (para 2-11).

End of Lesson 2

LESSON ASSIGNMENT

LESSON 3 Diagnosis of Pregnancy.

TEXT ASSIGNMENT Paragraphs 3-1 through 3-7.

LESSON OBJECTIVES After completing this lesson, you should be able to:

3-1. Identify key terms and definitions that are related to pregnancy.

3-2. Identify signs and symptoms of presumptive pregnancy.

3-3. Identify cause(s) for presumptive signs and symptoms of pregnancy.

3-4. Identify signs, which are probable signs of pregnancy.

3-5. Identify descriptive phrases of probable signs of pregnancy.

3-6. Identify positive signs of pregnancy.

3-7. Identify descriptive phrases, which refer to positive signs of pregnancy.

3-8. Identify three tests, which are used to determine pregnancy.

SUGGESTION After studying the assignment, complete the exercises at the end of this lesson. These exercises will help you to achieve the lesson objectives.

LESSON 3

DIAGNOSIS OF PREGNANCY

3-1. GENERAL

Many changes occur in a woman's body during pregnancy. These changes, although most apparent in the reproductive organs, involve other body systems as well. Weeks may pass before the female realizes she has become pregnant or she may learn upon a visit to a doctor for other reasons. Confirmation of her pregnancy is most important for both the mother and the fetus. It is then when she can begin receiving medical care for the health and welfare of herself and the baby. In this lesson, we will cover key definitions and present presumptive, probable, and positive signs of pregnancy along with tests used to determine pregnancy.

3-2. DEFINITIONS

a. **Gravida**. A pregnant woman. This refers to any pregnancy regardless of duration.

b. **Para**. A woman who has delivered a viable young (not necessarily living at birth). Para is used with numerals to designate the number of pregnancies that have resulted in the birth of a viable offspring (see para 3-3).

c. **Nulligravida**. A woman who has never been pregnant.

d. **Nullipara**. A woman who has not delivered a child who reached viability.

e. **Primigravida**. A woman pregnant for the first time.

f. **Primipara**. A woman who has delivered one child after the age of viability.

g. **Multigravida**. A woman who has been pregnant more than once.

h. **Multipara**. A woman who has delivered two or more fetuses past the age of viability. It does not matter whether they are born dead or alive.

i. **Grandmultipara**. A woman who has had six or more births past the age of viability.

j. **Viability**. Refers to the capability of a fetus to survive outside the uterus after the earliest gestational age (approximately 22 to 23 weeks gestation).

k. **In utero**. Refers to within the uterus.

3-3. PARITY/GRAVIDITY

In referring back to the definitions in paragraph 3-2, the information is abbreviated as parity/gravidity. For example, "0/1" means that a woman has not carried a pregnancy to viability (nullipara) and is pregnant for the first time (primigravida). Table 3-1 below shows parity and gravidity using a five-digit system:

CONDITION	FIVE-DIGIT SYSTEM				
	A	B	C	D	E
Jane is pregnant for the first time.	1	0	0	0	0
She carries the pregnancy to term and the neonate survives.	1	1	0	0	1
She is pregnant again.	2	1	0	0	1
Her second pregnancy ends in abortion.	2	1	0	1	1
During her third pregnancy, she delivers viable twins.	3	2	0	1	3

LEGEND:
A — Times uterus has been pregnant.
B — Number of deliveries.
C — Number of premature deliveries.
D — Number of abortions (spontaneous or therapeutic).
E — Number of living children.

Table 3-1. Five-Digit System.

3-4. PRESUMPTIVE SIGNS AND SYMPTOMS OF PREGNANCY

Presumptive signs and symptoms of pregnancy are those signs and symptoms that are usually noted by the patient, which impel her to make an appointment with a physician. These signs and symptoms are not proof of pregnancy but they will make the physician and woman suspicious of pregnancy.

a. **Amenorrhea (Cessation of Menstruation)**.

(1) Amenorrhea is one of the earliest clues of pregnancy. The majority of patients have no periodic bleeding after the onset of pregnancy. However, at least 20 percent of women have some slight, painless spotting during early gestation for no apparent reason and a large majority of these continue to term and have normal infants.

(2) Other causes for amenorrhea must be ruled out, such as:

(a) Menopause.

(b) Stress (severe emotional shock, tension, fear, or a strong desire for a pregnancy).

(c) Chronic illness (tuberculosis, endocrine disorders, or central nervous system abnormality).

(d) Anemia.

(e) Excessive exercise.

b. **Nausea and Vomiting (Morning Sickness)**.

(1) Usually occurs in early morning during the first weeks of pregnancy.

(2) Usually spontaneous and subsides in 6 to 8 weeks or by the twelfth to sixteenth week of pregnancy.

(3) Hyperemesis gravidarum. This is referred to as nausea and vomiting that is severe and lasts beyond the fourth month of pregnancy. It causes weight loss and upsets fluid and electrolyte balance of the patient.

(4) Nausea and vomiting are unreliable signs of pregnancy since they may result from other conditions such as:

(a) Gastrointestinal disorders (hiatal hernias, ulcers, and appendicitis).

(b) Infection (influenza and encephalitis).

(c) Emotional stress, upset (anxiety and anorexia nervosa).

(d) Indigestion.

c. **Frequent Urination.**

(1) Frequent urination is caused by pressure of the expanding uterus on the bladder.

(2) It subsides as pregnancy progresses and the uterus rises out of the pelvic cavity.

(3) The uterus returns during the last weeks of pregnancy as the head of the fetus presses against the bladder.

(4) Frequent urination is not a definite sign since other factors can be apparent (such as tension, diabetes, urinary tract infection, or tumors).

d. **Breast Changes**.

(1) In early pregnancy, changes start with a slight, temporary enlargement of the breasts, causing a sensation of weight, fullness, and mild tingling.

(2) As pregnancy continues the patient may notice:

(a) Darkening of the areola--the brown part around the nipple.

(b) Enlargement of Montgomery glands--the tiny nodules or sebaceous glands within the areola.

(c) Increased firmness or tenderness of the breasts.

(d) More prominent and visible veins due to the increased blood supply.

(e) Presence of colostrum (thin yellowish fluid that is the precursor of breast milk). This can be expressed during the second trimester and may even leak out in the latter part of the pregnancy.

(3) These breast changes can be more positive if the patient has not recently delivered and is not presently breastfeeding.

e. **Vaginal Changes**.

(1) Chadwick's sign. The vaginal walls have taken on a deeper color caused by the increased vascularity because of increased hormones. It is noted at the sixth week when associated with pregnancy. It may also be noted with a rapidly growing uterine tumor or any cause of pelvic congestion.

(2) Leukorrhea. This is an increase in the white or slightly gray mucoid discharge that has a faint musty odor. It is due to hyperplasia of vaginal epithelial cells of the cervix because of increased hormone level from the pregnancy. Leukorrhea is also present in vaginal infections.

f. **Quickening (Feeling of Life)**.

(1) This is the first perception of fetal movement within the uterus. It usually occurs toward the end of the fifth month because of spasmodic flutter.

(a) A multigravida can feel quickening as early as 16 weeks.

(b) A primigravida usually cannot feel quickening until after 18 weeks.

(2) Once quickening has been established, the patient should be instructed to report any instance in which fetal movement is absent for a 24-hour period.

(3) Fetal movement early in pregnancy is frequently thought to be gas.

g. **Skin Changes**.

(1) Striae gravidarum (stretch marks). These are marks noted on the abdomen and/or buttocks.

(a) These marks are caused by increased production or sensitivity to adrenocortical hormones during pregnancy, not just weight gain.

(b) These marks may be seen on a patient with Cushing's disease or a patient with sudden weight gain.

(2) Linea nigra.

(a) This is a black line in the midline of the abdomen that may run from the sternum or umbilicus to the symphysis pubis.

(b) This appears on the primigravida by the third month and keeps pace with the rising height of the fundus.

(c) The entire line may appear on the multigravida before the third month.

(d) This may be a probable sign if the patient has never been pregnant.

(3) Chloasma. This is called the "Mask of Pregnancy." It is a bronze type of facial coloration seen more on dark-haired women. It is seen after the sixteenth week of pregnancy.

(4) Fingernails. Some patients note marked thinning and softening by the sixth week.

h. **Fatigue**. This is a common complaint by most patients during the first trimester. Fatigue may also be a result of anemia, infection, emotional stress, or malignant disease.

i. **Positive Home Test**. These tests may not always be accurate, however, they are very effective today if they are performed properly.

3-5. PROBABLE SIGNS OF PREGNANCY

Probable signs of pregnancy are those signs commonly noted by the physician upon examination of the patient. These signs include uterine changes, abdominal changes, cervical changes, basal body temperature, positive pregnancy test by physician, and fetal palpation.

a. **Uterine Changes**.

(1) Position. By the twelfth week, the uterus rises above the symphysis pubis and it should reach the xiphoid process by the 36th week of pregnancy. These guidelines are fairly accurate only as long as pregnancy is normal and there are no twins, tumors, or excessive amniotic fluid.

(2) Size. The uterine increases in width and length approximately five times its normal size. Its weight increases from 50 grams to 1,000 grams.

(3) Hegar's sign. This is softening of the lower uterine segment just above the cervix. When the uterine is compressed between examining fingers, the wall feels tissue paper thin. The physician will use bimanual maneuver simultaneously (abdominal and vaginal) and will cause the uterus to tilt forward (see figure 3-1). The Hegar's sign is noted by the sixth to eighth week of pregnancy.

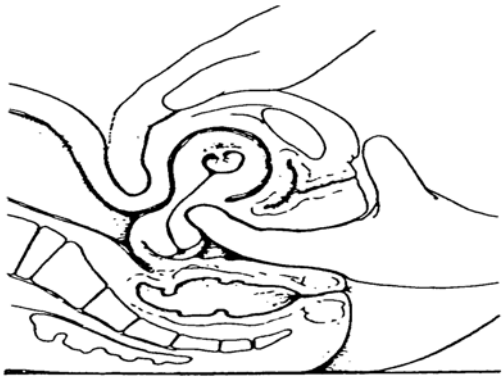


Figure 3-1. Hegar’s sign.

(4) Ballottement. This is demonstrated during the bimanual exam at the 16th to 20th week. Ballottement is when the lower uterine segment or the cervix is tapped by the examiner's finger and left there, the fetus floats upward, then sinks back and a gentle tap is felt on the finger (see figure 3-2). This is not considered diagnostic because it can be elicited in the presence of ascites or ovarian cysts.

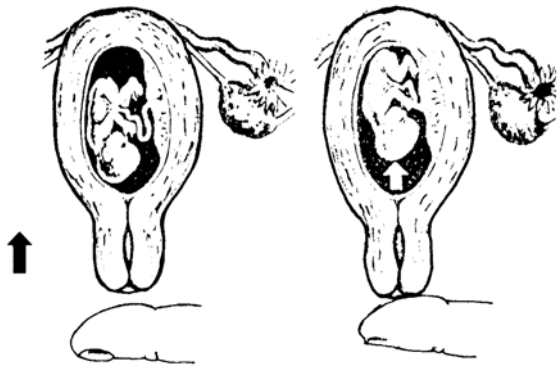


Figure 3-2. Ballotement.

b. **Abdominal Changes**. This corresponds to changes that occur in the uterus, as the uterus grows the abdomen gets larger. Abdominal enlargement alone is not a sign of pregnancy. Enlargement may be due to uterine or ovarian tumors, or edema. Striae gravidarum may also be classified as a probable sign of pregnancy by the physician.

c. **Cervical Changes**.

(1) Goodell's sign. The cervix is normally firm like the cartilage at the end of the nose. The Goodell's sign is when there is marked softening of the cervix. This is present at 6 weeks of pregnancy.

(2) Formation of a mucous plug. This is due to hyperplasia of the cervical glands as a result of increased hormones. It serves to seal the cervix of the pregnant uterus and to protect it from contamination by bacteria in the vagina (see figure 3-3). The mucous is expelled at the end of pregnancy near or at the onset of labor.

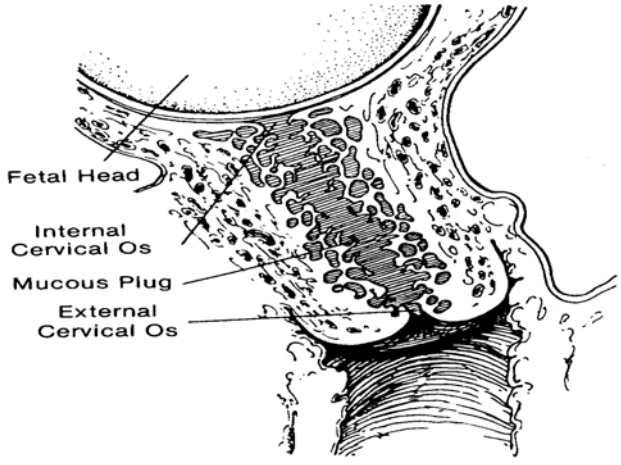


Figure 3-3. Cervix with mucous plug.

(3) Braxton-Hick's contractions. This involves painless uterine contractions occurring throughout pregnancy. It usually begins about the 12th week of pregnancy and becomes progressively stronger. These contractions will, generally, cease with walking or other forms of exercise. The Braxton-Hick's contractions are distinct from contractions of true labor by the fact that they do not cause the cervix to dilate and can usually be stopped by walking.

d. **Basal Body Temperature**. This is a good indication if the patient has been recording for several cycles previously. A persistent temperature elevation spanning over 3 weeks since ovulation is noted. Basal body temperature (BBT) is 97 percent accurate.

e. **Positive Pregnancy Test by the Physician**. This may be misread by doing it too early or too late. Even if the test is positive, it could be the result of ectopic pregnancy or a hydatidiform mole (an abnormal growth of a fertilized ovum) (see figure 3-4).

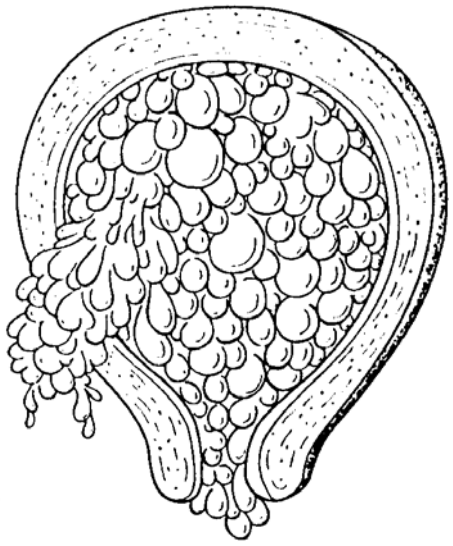


Figure 3-4. Hydatidiform mole.

f. **Fetal Palpation**. This is a probable sign in early pregnancy. The physician can palpate the abdomen and identify fetal parts. It is not always accurate, a mass in the abdomen may be palpated and mistakenly identified as an infant.

3-6. POSITIVE SIGNS OF PREGNANCY

Positive signs of pregnancy are those signs that are definitely confirmed as a pregnancy. They include fetal heart sounds, ultrasound scanning of the fetus, palpation of the entire fetus, palpation of fetal movements, x-ray, and actual delivery of an infant.

a. **Fetal Heart Sounds**. The fetal heart begins beating by the 24th day following conception. It is audible with a doppler by 10 weeks of pregnancy and with a fetoscope after the 16th week (see figure 3-5). It is not to be confused with uterine souffle or swishlike tone from pulsating uterine arteries. The normal fetal heart rate is 120 to 160 beats.

b. **Ultrasound Scanning of the Fetus**. The gestation sac can be seen and photographed. An embryo as early as the 4th week after conception can be identified. The fetal parts begin to appear by the 10th week of gestation.

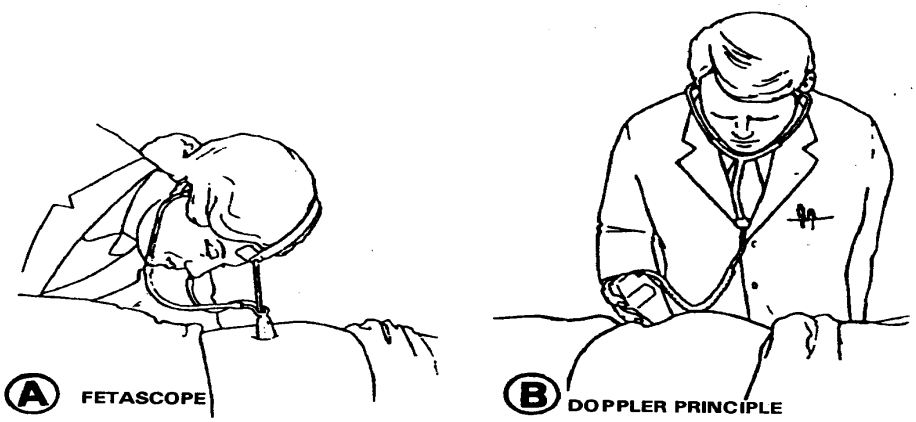


Figure 3-5. Detecting fetal heartbeat.

c. **Palpation of the Entire Fetus**. Palpation must include the fetus head, back, and upper and lower body parts. This is a positive sign after the 24th week of pregnancy if the woman is not obese.

d. **Palpation of Fetal Movement**. This is done by a trained examiner. It is easily elicited after 24 weeks of pregnancy.

e. **X-ray**. An x-ray will identify the entire fetal skeleton by the 12th week. In utero, the fetus receives total body radiation that may lead to genetic or gonadal alterations. An x-ray is not a recommended test for identifying pregnancy.

f. **Actual Delivery of An Infant**. Self-explanatory.

3-7. TESTS UTILIZED TO DETERMINE PREGNANCY

a. Tests are based on the presence of human chorionic gonadotropin (HCG) in the urine or blood.

(1) Urine. This test can be performed accurately 42 days after the last menstrual period or 2 weeks after the first missed period. The first urine specimen of the morning is the best one to use.

(2) Blood. Radioimmunoassays (RIA) can detect HCG in the blood 2 days after implantation or 5 days before the first menstrual period is missed.

NOTE: The Beta HCG level is observed in nuclear medicine. This is expensive to use.

NOTE: HCG levels peak between 50 to 90 days after the last menstrual period.

b. Home pregnancy test kits are easily available and inexpensive. This test allows prenatal care to be started early.

Continue with Exercises

EXERCISES, LESSON 3

INSTRUCTIONS: Answer the following exercises by marking the lettered response that best answers the exercise, by completing the incomplete statement, or by writing the answer in the space(s) provided.

After you have completed all of these exercises, turn to "Solutions to Exercises" at the end of the lesson and check your answers. For each exercise answered incorrectly, reread the material referenced with the solution.

1. Which of the following signs and symptoms of pregnancy is one of the earliest clues of pregnancy?

   a. Morning sickness.

   b. Vaginal changes.

   c. Breast changes.

   d. Amenorrhea.

2. Nausea and vomiting usually occurs:

   a. At night.

   b. Early morning.

   c. Mid afternoons.

   d. No specific time.

3. Frequent urination is <u>not</u> considered a definite sign of pregnancy because other factors can be apparent. The factors include:

   a. Tension, diabetes, urinary tract infection, or tumors.

   b. Influenza, encephalitis, appendicitis, or indigestion.

   c. Anxiety and anorexia nervosa.

   d. Excessive exercise.

4. Changes of the breast during early pregnancy are distinguished by:

   a. Darkening of the areola.

   b. Fullness and mild tingling.

   c. Increased firmness and tenderness.

   d. Enlargement of the Montgomery glands.

5. Some vaginal changes occur during pregnancy. These changes are the _____ and _____.

6. _____ is a black line in the midline of the abdomen that may run from the sternum or umbilicus to the symphysis pubis.

For exercises 7 through 15. Match the items in Column A with the correct definition or statement as listed in Column B. Place the letter of the correct answer in the space pr

COLUMN A

_____ 7. Quickening

_____ 8 Grandmultipara

_____ 9. Stretch marks

_____ 10. Primigravida

_____.11. Chloasma

_____.12. Fatigue

_____ 13. Multigravida

_____ 14. Hegar's sign more births past age if viability.

_____.15. Amenorrhea

COLUMN B

a. Probable sign of pregnancy.

b. A woman who has been pregnant more than once.

c. Feeling of life.

d. Cessation of menstruation.

e. Striae gravidarum.

f. Mask of pregnancy.

g. A woman who has had six or

h. Presumptive sign of pregnancy.

i. A woman pregnant for the first time.

For exercises 16 through 25. Each of the following phrases is closely related to a body part and is one of the signs or symptoms of pregnancy. Fill in the blanks opposite each phrase by writing the body part or action and the correct sign or symptom category.

Examples:

Fetal movement in the uterus. quickening/presumptive

Softening of the lower uterine segment just above the cervix. uterine/probable

16. Marks on the abdomen and/or buttocks. _____/_____.

17. Ballottement. _____/_____.

18. Enlargement of the Montgomery glands _____/_____..

19. An increase in the white or slightly gray mucoid discharge that has a faint, musty odor. _____/_____.

20. Can be heard with a doppler by weeks of pregnancy. _____/_____.

21. Marked softening of the cervix. _____/_____.

22. Entire fetus head, back, and upper/lower body parts. _____/_____.

23. Painless uterine contractions throughout pregnancy. _____/_____.

24. Gestation sac can be seen and photographed. _____/_____.

25. Presence of colostrum. _____/_____.

Check Your Answers on Next Page

SOLUTIONS TO EXERCSIES, LESSON 3

1. d (para 3-4a(1)).
2. b (para 3-4b(1)).
3. a (para 3-4c(4)).
4. b (para 3-4d(1)).
5. Chadwick's sign and Leukorrhea (para 3-4e(1), (2)).
6. Linea nigra (para 3-4g(2)(a))
7. c (para 3-4f)
8. g (para 3-2i)
9. e (para 3-4g(1))
10. i (para 3-2e)
11. f (para 3-4g(3))
12. h (para 3-4h)
13. b (para 3-2g).
14. a (para 3-5a(3)).
15. d (para 3-4a).
16. skin/presumptive (para 3-4g(1)).
17. uterine/probable (para 3-5a(4)).
18. breast/presumptive (para 3-4d(2)(b)).
19. vaginal/presumptive (para 3-4e(2)).
20. fetal heart sounds/positive (para 3-6a).
21. cervical/probable (para 3-5c(1)).
22. palpation of the entire fetus/positive (para 3-6c).

23. cervical/probable (para 3-5c(3)).

24. ultrasound scanning of the fetus/positive (para 3-6b).

25. breast/presumptive (para 3-4d(2)(e)).

End of Lesson 3

LESSON ASSIGNMENT

LESSON 4 Psychological Needs During Pregnancy.

TEXT ASSIGNMENT Paragraphs 4-1 through 4-11.

LESSON OBJECTIVES After completing this lesson, you should be able to:

4-1. Select emotional reactions, which a newly pregnant patient may feel.

4-2. Identify those factors, which influence the emotional reactions of the newly pregnant patient.

4-3. Identify descriptions of behavior of a prospective mother in the first trimester of pregnancy.

4-4. Identify specific characteristics exhibited by the prospective mother in the second trimester of pregnancy.

4-5. Select specific characteristics displayed by the prospective mother in the third trimester of pregnancy.

4-6. Identify phrases describing the adjustments of fathers during pregnancy.

4-7. Identify descriptive statements of the needs of single mothers.

4-8. Identify factors, which influence the role of the unwed father.

4-9. Identify factors affecting the parents of the unwed mother and father.

4-10. Select special needs of siblings during their mother's pregnancy.

SUGGESTION After studying the assignment, complete the exercises at the end of this lesson. These exercises will help you to achieve the lesson objectives.

LESSON 4

PSYCHOLOGIC NEEDS DURING PREGNANCY

4-1. GENERAL

Being pregnant is a very personal experience for each patient. This period in her life poses many new challenges and possible problems. How she responds to these challenges is dependent on her emotional maturity or lack of it. It is the responsibility of the practical nurse to help her understand and meet these challenges appropriately. You can help the patient, her mate, and significant others in their understanding of the physiologic changes that may occur during pregnancy.

4-2. EMOTIONAL REACTIONS EXPERIENCED BY A NEWLY PREGNANT PATIENT

Throughout a patient's pregnancy, her emotional reactions have been described as ambivalence, fear and anxiety, introversion or narcissism, and uncertainty. These feelings predominate at different periods of the pregnancy; other tends to fade in and out as the pregnancy progresses.

a. **Ambivalence**. This refers to the patient's simultaneous attraction for and against the pregnancy. The negative response to the pregnancy does not mean that she doesn't want the baby. She may simply have doubts as to whether she will be a good parent, wonder if she is ready for a baby, how a new baby will affect her family and her lifestyle, and so forth. This is not to say that she doesn't feel good about the pregnancy. Even though she may be doubtful in some ways, she may be experiencing joy and excitement as well as happiness and anticipation.

b. **Fear and Anxiety**. This refers to the patient being concerned for her own health and the health of her baby.

c. **Introversion or Narcissism**. The patient becomes concerned for herself. She may be preoccupied with her own thoughts and feelings.

d. **Uncertainty**. Before the patient can accept the fact that she is pregnant, she must ask herself "Am I really pregnant?" This may last until a positive diagnosis of pregnancy is confirmed by a physician. "Quickening" is usually a big milestone in the process of accepting the pregnancy.

4-3. FACTORS THAT MAY INFLUENCE THE EXTENT OF THESE REACTIONS

The previously mentioned emotional reactions of a pregnant patient may have some bearing on the following factors:

a. Is it a planned or a wanted pregnancy?

b. Is it the first pregnancy?

c. What experiences and memories does the patient have about previous pregnancies?

4-4. FIRST TRIMESTER OF PREGNANCY

New behaviors a prospective mother may engage in includes the following:

a. **Displays a Sense of Ambivalence to the Pregnancy**. You, as the practical nurse, must explain to the patient that what she is feeling is not unnatural. She must not be made to feel guilty about her ambivalence.

b. **Fantasize About The Pregnancy**. This may be mixed with a sense of fear or dread. The patient may dream about the impact a baby will have on her life and the lives of other family members. If the fantasies become moribund or characterized by excessive fear and cause despair, the patient may require counseling.

c. **Role Playing**. The patient may act the part of being a mother. She may spend time playing with children or babysitting other friends' babies. She may show more interest in caring for babies. She may pick them up more or talk with other women about their babies.

d. **Increased Concern For Financial and Social Problems**. Paying for a child, losing a job, or losing a second income for a while, the cost of child care, loss of freedom to come and go, and the requirement for a total commitment that may prevent her from performing social obligations may all be concerns for the new mother.

e. **Decreased Interest In Sex Due To Bodily Changes**. Nausea, vomiting, fatigue, and fear of injury to fetus may cause a loss of interest in sex. Increased vascularity to breast may yield breast tenderness or discomfort initially but this decreases as the pregnancy continues. Increased vascularity to the genitalia area may also be of concern. Fear of a miscarriage may cause the patient not to want sexual intercourse.

4-5. CHARACTERISTICS OF SECOND TRIMESTER OF PREGNANCY

a. The patient develops a sense of well-being. Her body becomes adjusted to hormonal changes. The early discomforts of pregnancy have subsided. Usually, she has adjusted psychologically to the realities and inconveniences, which accompany pregnancy. Her fears have subsided, at least temporarily. She has passed the initial miscarriage stage; she begins telling everyone she is pregnant. She develops a "glow" of pregnancy.

b. "Quickening" is experienced. The patient actually feels life; this act of fetal movement confirms the pregnancy. The father can also feel the movement; he can then identify with the reality of pregnancy and accept it.

c. The fetus heartbeat is heard.

d. Both parents develop an interest in fetal growth and development.

e. The interest in processes of labor and delivery is expressed. At this point, the parents may enroll in classes on childbirth and read appropriate literature.

f. The patient may have wide mood swings. She may be happy to sad for no apparent reason.

NOTE: Reassurance to the pregnant patient is very important to her--these are normal emotional reactions to pregnancy.

g. The patient may have a tendency to introvert or to focus on herself as the center of attention. She may concentrate on her own needs and the needs of the fetus inside her. She reflects on her own childhood and her relationship with her mother. She is preoccupied with her own thoughts and feelings. Preoccupation may cause trouble for her and those around her. Those persons close to the patient must be informed to expect her passiveness and dependency during this time. Extra love and attention should be given to her during this time, as this will allow the patient to give more of herself.

h. Changes in sexuality. The patient may have increased her interest in sex, the fear of pregnancy is no longer a problem and the fear of hurting the fetus is gone. There is an increase in sexual fantasies and dreams, and an increase in vaginal lubrication. An increase in vaginal lubrication increases comfort for the mother during intercourse. However, the partner may need to change positions for the comfort of the female.

4-6. PSYCHOLOGICAL CHARACTERISTICS OF THE PREGNANT PATIENT DURING THE THIRD TRIMESTER

a. **Altered Self-Image**. The patient is vacillating, going from being special, beautiful, and pretty to being ugly, awkward, unsexy, and feels fat.

b. **Fear**. She dreams about the infant and what the future holds for the new baby. She is concerned for the health and well-being of her baby. She is also concerned for her own safety and "performance" during labor and delivery.

c. **Aggravation**. The patient is aggravated over things she can't do for herself due to her size.

d. **Fatigue**. She becomes tired easily.

e. **Obsession**. She is concerned with delivery.

f. **Wondering**. The patient wonders what kind of parent she will be.

4-7. ADJUSTMENTS OF FATHERS DURING PREGNANCY

a. Men undergo far less social preparation than women do for parenthood. With a close, supportive family relationship, the father can receive help in his adjustment if needed. Essentially, there is nothing to prepare him for pregnancy per se. There are no doctor's appointments, baby showers, or the physiologic changes of true pregnancy, although some men have expressed having some of the physical discomforts.

b. Introduction comes with the actual confirmation of the diagnosis of pregnancy, focusing more on impending fatherhood rather than the immediate state of pregnancy. Accepting the fact of pregnancy can raise excitement versus denial, that is, is it really his? This may cause guilt feelings over the discomforts his partner may be experiencing and may develop a new image of himself and his altered responsibilities.

c. The father is busily reworking the family budget to afford a child.

d. He may need encouragement to participate in the preparation for parenting. Encourage him to accompany his partner on prenatal visits. These visits can allow him to listen to the fetal heart tones (FHT). The growth and development of the fetus should be explained to him. He should also be included in office visits. Encouraging him to participate in classes on natural childbirth, parenting, and childcare are all important. Allow the father to participate in the labor and delivery process if he expresses a desire to participate.

4-8. SINGLE MOTHERS

a. **Reasons for Single Mothers**.

(1) Unmarried. Several reasons contribute to the woman being unmarried. There may have been an unplanned pregnancy and a decision was made not to marry the father of the child. Pregnancy could marry the father of the child. Pregnancy could be the result of a rape and the patient decided not to terminate the pregnancy. A patient just may desire a child without the commitment of a marriage.

(2) Widowed.

(3) Divorced. There may have been a planned pregnancy in an effort to save a marriage and it did not work. It may have been totally unplanned and the patient decided to continue with the divorce and the pregnancy.

(4) Separation. The father may be imprisoned, may be on military duty, or just separated from the mother.

(5) Surrogate mother. A woman who carries the fetus of the infertile woman's husband and then relinquishes the child to the couple for rearing. This is usually done for couples that have difficulty with delivering a viable fetus.

b. **Counseling**. Most single patients need counseling regardless of their age. This counseling is done to:

(1) Aid her to make realistic plans for her child's future.

(2) Provide assistance to help her cope with emotional stress especially during labor. If at all possible, have the patient find a friend to go through labor with her.

(3) Provide sources of counseling to include whether to have an abortion, keep the child, or put the child up for adoption.

(4) Inform her of community agencies that may help her financially with childcare and other responsibilities.

(5) Provide mechanisms to help her cope with loneliness.

c. **Pregnant Teenager--Married or Not**.

(1) The teenager is still growing. She needs a specialized nutritional nursing care plan. The diet should be adjusted to what and where she normally eats.

(2) There is a high mortality and morbidity for mothers under 20 years of age and their infants. Because of the lack of prenatal care, she may try to hide the pregnancy.

(3) The teenager lacks compliance with instructions and lack of physical and psychological maturity. She has not yet achieved physical and psychological maturity.

4-9. FACTORS INFLUENCING THE ROLE OF THE UNWED FATHER

a. **Economic--Can He Support a Child**. Does he have a job? Is he married with another family to support? What is the age of the father? If a teenager, is he still in school?

b. **Social Implications**. These implications indicate the reaction of the news by his peers. Will the pregnancy force an early marriage? If married to someone else, how will this affect that relationship?

c. **Psychological Response**.

(1) May question whether he is the father.

(2) May experience a sense of loss or grief if he cannot be involved with the child. In some states, adoption without his consent may be allowed.

(3) May experience anger from the girl, her or his parents.

(4) May affect his relationship with another female.

4-10. FACTORS AFFECTING THE PARENTS OF THE UNWED MOTHER AND FATHER

The parents of the unwed mother and father are also important. They may be concerned with the following reactions/emotions:

a. Rejection or neglect from family or friends.

b. May feel exposed to judgmental attitudes of medical and nursing personnel over how they could have let this happen.

c. May feel guilty for what happened.

d. May face financial burden, especially if they decide to keep or adopt the child.

e. May face a permanent loss of a grandchild if the child is given up for adoption.

f. May face loss of relationship with their child as a result of the decision made.

4-11. SPECIAL NEEDS OF SIBLINGS

The response of siblings to pregnancy varies with age and dependence needs. Open communication with siblings will be very beneficial. Inform the parents to:

a. Prepare children for the arrival of the newborn.

(1) Consider ages and personalities when talking with children.

(2) Inform older children first, but do not leave out the younger ones. Children understand far more than you may think.

(3) Emphasize that the baby is not replacing anyone but is an addition to be loved by all.

b. Make physical changes to the home if necessary.

(1) Changes should be made well in advance, especially if it means changing siblings room or bed arrangements.

(2) Include children in the changes and adjustments.

c. Prepare children for the separation from their mother during the delivery.

(1) Evaluate hospital sibling visitation policies in advance.

(2) If available, let siblings go meet the newborn and see their mother in the hospital.

Continue with Exercises

EXERCISES, LESSON 4

INSTRUCTIONS: Answer the following exercises by marking the lettered response that best answers the exercise, by completing the incomplete statement, or by writing the answer in the space(s) provided.

After you have completed all of these exercises, turn to "Solutions to Exercises" at the end of the lesson and check your answers. For each exercise answered incorrectly, reread the material referenced with the solution.

1. List the emotional reactions that a pregnant patient experiences throughout her pregnancy.

   _____ _____

   _____ _____

2. What factors may influence a pregnant patient's emotional reactions?

   _____

   _____

   _____

3. All of the following statements/phrases are new behaviors that a prospective mother may engage in during her first trimester of pregnancy EXCEPT:

   a. Displays a sense of ambivalence to the pregnancy.

   b. Fantasize about the pregnancy.

   c. Increase concern for money.

   d. All of the above.

   e. Only a and b.

4. At what point in the pregnancy would a patient have "wide" mood swings?

   _____

5. List the psychological characteristics of a pregnant patient during her third trimester of pregnancy.

_____

_____

_____

_____

_____

_____

6. Men always undergo more social preparation for parenthood than women.

   a. True.

   b. False

7. Fatigue and obsession are psychological characteristics of the pregnant patient during the third trimester.

   a. True.

   b. False

8. Role playing is usually done during the first trimester of pregnancy.

   a. True.

   b. False

9. The baby's first heartbeat is heard during the first trimester of pregnancy.

   a. True.

   b. False

10. A teenager stops growing once she becomes pregnant.

    a. True.

    b. False

11. Counseling is only done for unwedded teenagers.

    a. True.

    b. False

12. A surrogate mother is one reason for a woman being a single mother.

    a. True.

    b. False

13. Social implications is one factor which may influence the role of the unwed father.

    a. True.

    b. False

14. The parents of the unwed mother and father may feel guilty for what happened.

    a. True.

    b. False

15. Never include siblings when making changes and adjustments in the home for a newborn.

    a. True.

    b. False

Check Your Answers on Next Page

SOLUTIONS TO EXERCISES, LESSON 4

1. ambivalence.
   fear and anxiety.
   introversion or narcissism.
   uncertainty (para 4-2).

2. Was the pregnancy planned or wanted?
   Was it the first pregnancy?
   What experiences and memories does the patient have about previous pregnancies. (para 4-3)

3. d (para 4-4).

4. Second trimester of pregnancy. (para 4-5f)

5. altered self-image.
   Fear.
   Aggravation.
   Fatigue.
   Obsession.
   wondering (para 4-6)

6. b (para 4-7a).

7. a (para 4-6d and e).

8. a (para 4-4c).

9. b (para 4-5c).

10. b (para 4-8c(1)).

11. b (para 4-8b).

12. a (para 4-8a(5)).

13. a (para 4-9b).

14. a (para 4-10c).

15. b (para 4-11b(2)).

End of Lesson 4

LESSON ASSIGNMENT

LESSON 5 Physiologic Changes During Pregnancy.

TEXT ASSIGNMENT Paragraphs 5-1 through 5-12.

LESSON OBJECTIVES After completing this lesson, you should be able to:

5-1. Identify changes, which occur in the uterus, cervix, vagina, and ovaries during pregnancy.

5-2. Select changes of the skin and breast that occurs during pregnancy.

5-3. Identify changes, which occur in the circulatory system, respiratory system, urinary system, skeletal system, and gastrointestinal system during pregnancy.

5-4. Identify changes, which occur in the cardiac output during pregnancy.

5-5. Identify nursing indications for a patient who may have changes in her blood pressure during pregnancy.

5-6. Identify changes, which occur in the body temperature during pregnancy.

5-7. Identify nursing implications for the patient with gastrointestinal symptoms.

5-8. Identify changes in the endocrine system and placenta during pregnancy.

5-9. Identify changes in weight, which occur during pregnancy.

SUGGESTION After studying the assignment, complete the exercises at the end of this lesson. These exercises will help you to achieve the lesson objectives.

LESSON 5

PHYSIOLOGIC CHANGES DURING PREGNANCY

5-1. GENERAL

The changes that occur in the pregnant patient's body are caused by several factors. Many of these changes are the result of hormonal influence, some are caused by the growth of the fetus inside the uterus, and some are the result of the patient's physical adaptation to the changes that are occurring. This lesson is closely related to anatomy and physiology.

5-2. CHANGES OF THE REPRODUCTIVE SYSTEM DURING PREGNANCY

Changes in the body during pregnancy are most obvious in the organs of the reproductive system.

a. **Uterus**.

(1) Changes in the uterus are phenomenal. By the time the pregnancy has reached term, the uterus will have increased five times its normal size:

(a) In length from 6.5 to 32 cm.

(b) In depth from 2.5 to 22 cm.

(c) In width from 4 to 24 cm.

(d) In weight from 50 to 1000 grams.

(e) In thickness of the walls from 1 to 0.5 cm.

(2) The capacity of the uterus must expand to normally accommodate a seven-pound fetus and the placenta, the umbilical cord, 500 ml to 1000 ml of amniotic fluid, and the fetal membranes.

(3) The abdominal contents are displaced to the sides as the uterus grows in size, which allows for ample space for the uterus within the abdominal cavity.

(a) Growth of the uterus occurs at a steady, predictable pace.

(b) Measurement of the fundal height during pregnancy is an important factor that is noted and recorded (see figure 5-1).

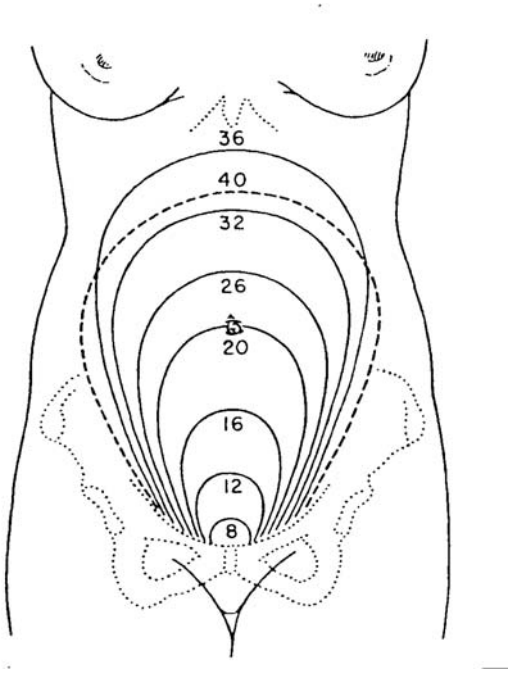


Figure 5-1. Appproximate height of the fundus at various weeks of pregnancy.

(c) Growth that occurs too fast or too slow could be an indication of problems.

(d) The size of the uterus usually reaches its peak at 38 weeks gestation. The uterus may drop slightly as the fetal head settles into the pelvis, preparing for delivery. This dropping is referred to as "lightening." This is more noticeable in a primigravida than a multigravida.

NOTE: Remember a primigravida is a woman pregnant for the first time. A multigravida is a woman who has been pregnant more than once.

b. **Cervix**.

(1) The cervix undergoes a marked softening which is referred to as the Goodell's sign."

(2) A mucus plug, which is known as "operculum" is formed in the cervical canal. This is the result of enlarged and active mucus glands of the cervix. It serves to seal the uterus and to protect the fetus and fetal membranes from infection. The mucus plug is expelled at the end of the pregnancy. This may occur at the onset of labor or precede labor by a few days. When the mucus is blood-tinged, it is referred to as a "bloody show."

(3) Additional changes and softening of the cervix occur prior to the beginning of labor.

c. **Vagina**. Increased circulation to the vagina early in pregnancy changes the color from normal light pink to a purple hue which is known as the "Chadwick's sign."

d. **Ovaries**.

(1) The follicle-stimulating hormone (FSH) ceases its activity due to the increased levels of estrogen and progesterone secreted by the ovaries and corpus luteum. The FSH prevents ovulation and menstruation.

(2) The corpus luteum enlarges during early pregnancy and may even form a cyst on the ovary. The corpus luteum produces progesterone to help maintain the lining of the endometrium in early pregnancy. It functions until about the 10th to 12th week of pregnancy when the placenta is capable of producing adequate amounts of progesterone and estrogen. It slowly decreases in size and function after the 10th to 12th week.

5-3. CHANGES OF THE SKIN DURING PREGNANCY

Alterations in hormonal balance and mechanical stretching are responsible for several changes in the integumentary system. The following changes occur during pregnancy:

a. **Linea Nigra**. This is a dark line that runs from the umbilicus to the symphysis pubis and may extend as high as the sternum. It is a hormone- induced pigmentation. After delivery, the line begins to fade, though it may not ever completely disappear.

b. **Mask of Pregnancy (Chloasma)**. This is the brownish hyper pigmentation of the skin over the face and forehead. It gives a bronze look, especially in dark-complexioned women. It begins about the 16th week of pregnancy and gradually increases, then it usually fades after delivery.

c. **Striae Gravidarum (Stretch Marks)**. This may be due to the action of the adrenocorticosteroids. It reflects a separation within underlying connective tissue of the skin. This occurs over areas of maximal stretch--the abdomen, thighs, and breasts. It will usually fade after delivery although they never completely disappear.

d. **Sweat Glands**. Activity of the sweat glands throughout the body usually increases which causes the woman to perspire more profusely during pregnancy.

5-4. CHANGES OF THE BREASTS

a. In early pregnancy, the breast may feel full or tingle, and increase in size as pregnancy progresses. The areola of the nipples darken and the diameter increases.

The Montgomery's glands (the sebaceous glands of the areola) enlarge and tend to protrude. The surface vessels of the breast may become visible due to increased circulation and turns to a bluish tint to the breasts.

b. By the 16th week (2nd trimester) the breasts begin to produce colostrum. This is the precursor of breast milk. It is a thin, watery, yellowish secretion that thickens as pregnancy progresses. It is extremely high in protein.

c. Nursing implication: Inform the pregnant patient to wear a good, supporting bra.

5-5. CHANGES OF THE CIRCULATORY SYSTEM DURING PREGNANCY

a. **Blood Volume**.

(1) Blood volume increases gradually by 30 to 50 percent (1500 ml to 3 units). This results in decrease concentration of red blood cells and hemoglobin. This explains why the need for iron is so important during pregnancy.

(2) By the time pregnancy reaches term, the body has usually compensated for the decrease resulting in an essentially normal blood count.

(3) Blood count is interpreted as anemia by the physician if the hemoglobin falls below 10.5 grams per 100 ml and the hematocrit drops below 30 percent.

(4) Increased blood volume compensates for hypertrophied vascular system of enlarged uterus. It improves the placental performance. Blood lost during delivery, less than 500 cc is normal (300 to 400 cc is average).

b. **Cardiac Output**.

(1) Cardiac output increases about 30 percent during the first and second trimester to accommodate for hypervolemia. This is not a problem for patients with a normal heart. A patient with a diseased heart is especially at risk for cardiac decompensation 28 to 35 weeks of pregnancy when the blood volume and cardiac load are at their peak; also, during labor and immediately after delivery when rapid hemodynamic changes occur.

(2) Change in output is reflected in the heart rate. It usually increases by 10 beats per minute.

(3) Nursing implication. Patients with a diseased heart need to be advised to get plenty of rest and to report any shortness of breath or unusual symptoms to their physician.

c. **Blood Pressure**.

(1) Normally, the patient's blood pressure will not rise.

(2) Nursing implications.

(a) The patient's blood pressure should be checked carefully and often since a significant increase is one of the indicators of toxemia of pregnancy.

(b) When monitoring the blood pressure, be sure it is done under the same circumstances (that is, patient sitting and left arm).

d. **Venous Return**.

(1) The lower extremities are often hampered in the last months of pregnancy due to the expanding uterus restricting physical movement and interfering with the return of blood flow. This results in swelling of the feet and legs.

(2) Nursing implications.

(a) Advise the patient to rest frequently. This will improve venous return and decrease edema.

(b) Have the patient to elevate her feet and legs while sitting.

(c) Remind the patient not to lie in a supine position since this inhibits return blood flood flow as the heavy uterus presses on the vessels. This leads to the vena cava syndrome (see figure 5-2) or supine hypotension. The patient may complain of feeling dizzy, nauseated, or weak.

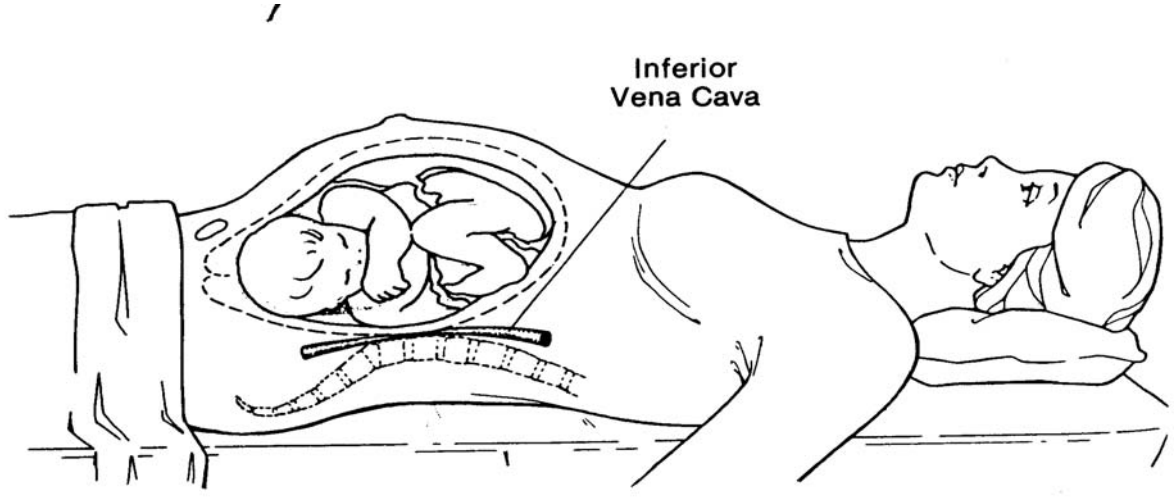


Figure 5-2. Vena cava syndrome.

5-6. CHANGES OF THE RESPIRATORY SYSTEM DURING PREGNANCY

a. The respiratory rate rises to 18 to 20 to compensate for increased maternal oxygen consumption, which is needed for demands of the uterus, the placenta, and the fetus.

b. Women may feel out of breath and may need to sit a moment to catch their breath.

5-7. CHANGES OF BODY TEMPERATURE DURING PREGNANCY

a. A slight increase in body temperature in early pregnancy is noted. The temperature returns to normal at about the 16th week of gestation.

b. The patient may feel warmer or experience "hot flashes" caused by increased hormonal level and basal metabolic rate.

5-8. CHANGES OF THE URINARY SYSTEM DURING PREGNANCY

a. The kidneys must work extra hard excreting the mother's own waste products plus those of the fetus. There is an increase in urinary output and a decrease in the specific gravity.

b. The patient may develop urine stasis and pyelonephritis in the right kidney. This is due to pressure on the right ureter resulting from displacement of the uterus slightly to the right by the sigmoid colon.

c. Frequent urination is a complaint during the first through third trimester. As the uterus rises out of the pelvic cavity in early pregnancy, pressure on the bladder decreases and frequency diminishes. When lightening occurs during the final weeks of pregnancy, pressure on the bladder returns to cause frequency.

5-9. CHANGES OF THE SKELETAL SYSTEM DURING PREGNANCY

a. There is a realignment of the spinal curvatures during pregnancy to maintain balance (see figure 5-3). It is due to the increase in size of the uterus and pressure on the abdominal wall. The patient walks with head and shoulders thrust backward and chest protruding outward to compensate. This gives the patient a "waddling" gait.

b. There is a slight relaxation and increased mobility of the pelvic joints, which allows stretching at the time of delivery of the infant.

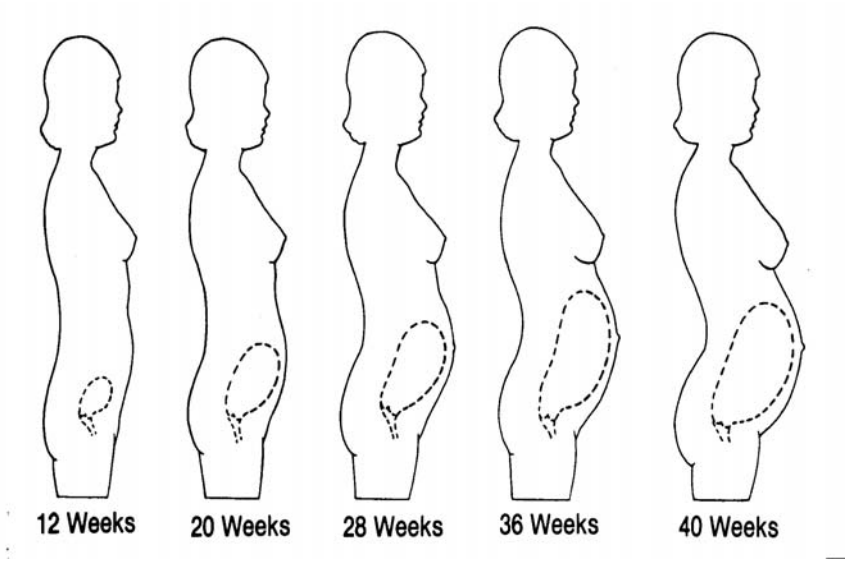


Figure 5-3. Postural changes during pregnancy.

5-10. CHANGES OF THE GASTROINTESTINAL SYSTEM DURING PREGNANCY

a. As mentioned in paragraph 5-1, as the pregnancy progresses, the uterus enlarges. It rises up and out of the pelvic cavity. This action displaces the stomach, intestines, and other adjacent organs.

b. Peristalsis is slowed because of the production of the hormone progesterone, which decreases tone and mobility of smooth muscles. This slowing enhances the absorption of nutrients and slows the rate of secretion of hydrochloric acid and pepsin. Flare-up of peptic ulcers is uncommon in pregnancy. Slow emptying may increase nausea and heartburn (pyrosis). Relaxation of the cardiac sphincter may increase regurgitation and chance for heartburn. Movement through the large intestines is also slowed due to an increase in water consumption from this area. This increases the chance for constipation.

c. Nursing implications.

(1) If the mother has difficulty with nausea and/or heartburn, advise her to eat small, frequent meals.

(2) The patient should eat a well- balanced diet high in protein, iron, and calcium for fetal growth; high fiber and fluids to prevent constipation.

(3) The mother should not lie flat for 1 to 2 hours after eating because this may cause heartburn and/or regurgitation.

5-11. CHANGES OF SELECTED GLANDS OF THE ENDOCRINE SYSTEM DURING PREGNANCY

a. **Parathyroid Gland**. This gland increases in size slightly. It meets the increased requirements for calcium needed for fetal growth.

b. **Posterior Pituitary**. Near the end of term, the posterior pituitary will begin to secrete oxytocin that was produced in the hypothalamus and stored there. It will serve to initiate labor.

c. **Anterior Pituitary**. At birth, the anterior pituitary will begin to secrete prolactin. This stimulates the production of breast milk.

d. **Placenta**. The placenta acts as a temporary endocrine gland during pregnancy. It produces large amounts of estrogen and progesterone by 10 to 12 weeks of pregnancy. It serves to maintain the growth of the uterus, helps to control uterine activity, and is responsible for many of the maternal changes in the body.

5-12. CHANGES IN BODY WEIGHT DURING PREGNANCY

a. Normal weight gain is about 24 to 30 pounds during pregnancy.

b. Weight gain in pregnancy.

(1) There is a slight loss of pounds during early pregnancy if the patient experiences much nausea and vomiting.

(2) She then gains 2 to 4 pounds by the end of the first trimester.

(3) A gain of a pound per week is expected during the second and third trimesters.

(4) Monitoring of weight gain should be done in conjunction with close monitoring of blood pressure.

(5) A lack of significant weight gain may be an indication of intrauterine growth retardation (IUGR) of the infant.

(6) Patients with multiple fetuses will require a higher caloric diet and expect a higher weight gain than a patient with only one fetus.

c. Adequate protein intake should be emphasized to the patient for development of the healthy fetus and proper diet reviewed at each prenatal visit.

Continue with Exercises

EXERCISES, LESSON 5

INSTRUCTIONS: Answer the following exercises by marking the lettered response that best answers the exercise, by completing the incomplete statement, or by writing the answer in the space(s) provided.

After you have completed all of these exercises, turn to "Solutions to Exercises" at the end of the lesson and check your answers. For each exercise answered incorrectly, reread the material referenced with the solution.

1. The size of the uterus usually reaches its peak in growth at:

   a. 30 weeks of gestation.

   b. 34 weeks of gestation.

   c. 36 weeks of gestation.

   d. 38 weeks of gestation.

2. Mechanical stretching and alterations in hormonal balance are responsible for changes in the _____ system.

   a. Urinary.

   b. Reproductive.

   c. Integumentary.

   d. Gastrointestinal.

3. The breast begins to produce _____ about the 16th week of pregnancy.

4. The average amount of blood lost during delivery is _____ to _____ cc.

5. Why are the lower extremities often hampered in the last months of pregnancy?

_____

6. Body temperature may increase slightly during early pregnancy.

   a. True.

   b. False.

7. There is a decrease in urination throughout pregnancy.

   a. True.

   b. False.

8. Flare-up of peptic ulcers is uncommon in pregnancy.

   a. True.

   b. False.

9. Realignment of the spinal curvatures during pregnancy is to maintain balance.

   a. True.

   b. False.

10. The respiratory rate rises to compensate for increased maternal oxygen consumption.

    a. True.

    b. False.

11. The parathyroid gland meets the increased requirements for protein during pregnancy.

    a. True.

    b. False.

12. The blood pressure of all pregnant patients will rise greatly.

    a. True.

    b. False.

13. Changes in the heart rate usually increases by 12 beats per minute.

    a. True.

    b. False.

14. A mucus plug is formed in the pregnant patient's cervical canal.

    a. True.

    b. False.

Check Your Answers on Next Page

SOLUTIONS TO EXERCISES, LESSON 5

1. d (para 5-2a(3)(d)).

2. c (para 5-3).

3. colostrum (para 5-4b).

4. 300 to 400 cc (para 5-5a(4)).

5. Due to the expanding uterus restricting physical movement and interfering with the return of blood flow. (para 5-5d(1)).

6. a (para 5-7a).

7. b (para 5-8c).

8. a (para 5-10b).

9. a (para 5-9a).

10. a (para 5-6a).

11. b (para 5-11a).

12. b (para 5-5c(1)).

13. b (para 5-5b(2)).

14. a (para 5-2b(2)).

End of Lesson 5

LESSON ASSIGNMENT

LESSON 6	Prenatal Care During Pregnancy.
TEXT ASSIGNMENT	Paragraphs 6-1 through 6-5.
LESSON OBJECTIVES	After completing this lesson, you should be able to:

6-1. Identify terms and definitions that are related to prenatal care.

6-2. Identify the objectives of prenatal care.

6-3. Identify descriptive statements referring to the initial prenatal visit.

6-4. Identify activities performed by the nurse during the patient's prenatal visit.

6-5. Identify instructions given to the mother during her first prenatal visit.

SUGGESTION After studying the assignment, complete the exercises at the end of this lesson. These exercises will help you to achieve the lesson objectives.

LESSON 6

PRENATAL CARE DURING PREGNANCY

6-1. GENERAL

The prenatal period is a preparatory time for the mother to prepare herself both physically and psychologically. It is a time of immense anxiety, excitement, and learning. The best way to ensure the health of both the expectant mother and her infant is through early and attentive prenatal care. Close supervision will allow health care professionals to identify and possibly treat maternal disorders that may have been preexistent or developed during the pregnancy. This lesson will include what occurs during the prenatal visits.

6-2. TERMS AND DEFINITIONS

a. **Abortion**. Termination of pregnancy before the fetus is viable and capable of extrauterine existence.

b. **Conjugate**. An important diameter of the pelvis, measured from the center of the promontory of the sacrum to the back of the symphysis pubis.

c. **Ischial Spines**. Two relatively sharp, bony projections protruding into the pelvic outlet from the ischial bone that form the lower lateral border of the pelvis. They are used when determining the progress of the fetus down the birth canal.

d. **Ischial Tuberosities**. A major bony, sitting support; important in measuring a transverse diameter of the pelvis.

e. **Miscarriage**. Spontaneous abortion; lay term usually referring specifically to the loss of the fetus between the fourth month and viability.

f. **Placenta Abruptio**. Premature separation of a normally, implanted placenta.

g. **Placenta Previa**. A placenta that is implanted in the lower uterine segment so that it adjoins or covers the internal os of the cervix.

h. **Term Pregnancy**. A gestation of 38 to 42 weeks.

i. **Toxoplasmosis**. A congenital disease characterized by lesions of the central nervous system which may lead to blindness, brain defects, and death.

6-3. PRINCIPLES OF PRENATAL CARE

a. **Definition**. Antepartal or prenatal care refers to the medical and nursing supervision and care given to the pregnant patient during the period between conception and the onset of labor.

b. **Objectives of Prenatal Care**. During the initial visit, the objectives are directed toward confirming a diagnosis of pregnancy and beginning the process of data collection to act as a basis for ongoing prenatal care. These objectives include:

(1) Prevention of complication.

(2) Modification of those complications that may develop.

(3) Support of the patient's goal to carry the infant to term and deliver a healthy baby.

(4) Education of the mother-to-be and her family for the parenting role.

(5) Inclusion of the family as a whole in the concept of "family-centered maternity care."

c. **Health Care Professionals**. Health care professionals involved in the administration of the prenatal care includes:

(1) Physicians. They are primarily involved in diagnosing normal and abnormal conditions associated with the childbearing cycle.

(2) Nursing personnel. Nursing personnel includes the nurse practitioners, clinical nurse specialists, registered nurses, and licensed practical nurses. Nursing personnel serves as teachers, counselors, and resource personnel. They have the responsibility to develop and implement nursing care plans.

(3) Others. Other health care personnel that are involved in prenatal care are:

(a) Dietitians.

(b) Laboratory technicians.

(c) Social services.

(d) Occupational therapists.

(e) Similar support personnel.

d. **Choice of Health Care Professionals**. The pregnant patient is responsible to choose the type of individual she prefers to consult for prenatal supervision and care. She may choose a private obstetrician, family practice physician, clinic with no control over which physician provides the care, or a nurse midwife. The primary concern is whether the individual she chooses meets her goals, desires, and expectations.

e. **Early Care**. Early, competent care is essential for the patient to avoid unnecessary risks to herself and her fetus.

6-4. INITIAL PRENATAL VISIT

a. The initial prenatal visit should be scheduled at the first signs of pregnancy. This is usually shortly after the second menstrual cycle is missed. Depending on where the care is to be given, the first prenatal visit may not be scheduled until after a positive urine pregnancy test is documented.

b. The initial prenatal visit may be particularly stressful to the patient. Some patients may be anxious about the nature of exams and tests to be done during the visit. The pregnancy may have been unplanned, there may be already existing financial or family problems, or some patients may have had unpleasant experiences with previous pregnancies. The presence of one or more of these problems may serve to heighten the emotional content of the visit.

c. Setting a comfortable climate is very important to the patient. The patient's first impression and initial reception will influence how she may comply with the instructions given during pregnancy. If treated with a true concern as an individual, she will be more inclined to follow instructions. If the patient is rushed with little concern for her as an individual, she may decide not to return. A cordial, respectful environment in which the patient feels like a person is a necessity for every visit.

d. A thorough medical/obstetrical history is obtained. The history is essentially a screening tool that identifies the factors that may detrimentally affect the course of pregnancy. This process involves interviewing the patient and possibly having the patient to complete a questionnaire to obtain the following information:

NOTE: See figures 6-1 and 6-2 for a typical prenatal questionnaire and a prenatal and pregnancy medical record.

(1) Past medical history of the patient's mother and father (for example, hypertension, diabetes, and tuberculosis).

(2) Family illnesses (that is, diabetes, mental illness, and bleeding disorders).

PRENATAL QUESTIONNAIRE

Last Name - First Name - Maiden Name		Age
Husband's Last Name - First Name - Middle Initial	Grade	Age
Address		Telephone No
Husband's Duty Station		Telephone No
Religion	Height	Weight Before Pregnancy

Number of times you have been pregnant (including present pregnancy): _____
Number of times you have delivered after 6 months: _____
Number of times you have lost a pregnancy before 6 months: _____
Number of your children who are living now: _____
First day of your last menstrual period: _____

PAST MEDICAL HISTORY

1. How is your general health? ☐ Good ☐ Fair ☐ Poor

Have you been under a physician's care for, or are you aware of, any problem you have in relation to:

	Yes	No
2. Frequent headaches, migraine, or fainting spells	☐	☐
3. Visual problems, contact lenses, etc.	☐	☐
4. Frequent earaches, deafness or dizzy spells	☐	☐
5. Frequent nose bleeds or sinusitis	☐	☐
6. Frequent sore throats, tonsillitis or hoarseness	☐	☐
7. Goiter, thyroid problems, abnormal metabolism	☐	☐
8. Frequent cough, tuberculosis, pneumonia, other lung problems	☐	☐
9. Heart murmur, leaky valve, rheumatic fever, high blood pressure, blood clots, phlebitis	☐	☐
10. Nausea and vomiting, ulcer, hepatitis, gall bladder trouble, fatty food intolerance, diabetes, constipation, diarrhea, bloody bowel movements	☐	☐
11. Kidney infection, kidney stone, pus in your urine, pain with or frequency of urination	☐	☐
12. Irregular periods, female problems, venereal disease	☐	☐
13. Anemia, low blood, leukemia, excessive bleeding	☐	☐
14. Infectious mononucleosis, swollen glands	☐	☐
15. Poliomyelitis, muscular disorders, frequent backache	☐	☐
16. Psychiatric problems, nervous breakdown, depression, nervousness, emotional problems	☐	☐
17. Have you ever received a blood transfusion or Rhogam or had an Rh problem	☐	☐
18. Are you allergic or sensitive to any drugs or medicine? Do you have asthma, hay fever or other allergy	☐	☐
19. Did you have any serious childhood illnesses or any complications of chicken pox, measles, German measles, or mumps	☐	☐
20. Have you had any operations (tonsils, D&C, appendix, etc. What and when:	☐	☐
21. Have you had any serious injuries, broken any bones or been knocked unconscious What and when:	☐	☐

Figure 6-1A. BAMC Form 287 NS, Prenatal Questionnaire (front)

FAMILY HISTORY

Mother Living? ☐ Yes ☐ No. Age ____ If deceased, age at time of death and cause of death)

_____

Father Living? ☐ Yes ☐ No Age ____ If deceased, age at time of death and cause of death)

_____

Have any of your relatives (parents, brothers, sisters, grandparents, aunts, uncles, cousins) had diabetes, kidney disease, high blood pressure?

List: _____

_____

How old were you when your periods started? _____

How long does your period last? _____

How long is it from the start of one period to the start of the next? _____

Do you have a problem with painful periods? ☐ Yes ☐ No

Previous Pregnancies (Including Miscarriages, Etc.)

	1	2	3	4	5	6
Date of delivery (or miscarriage)						
Weeks or months completed						
Duration of labor						
Type of delivery (normal, breech, Cesarean, etc.)						
Anesthesia						
Hospital						
Sex of baby						
Birth weight						
Complications or remarks (include child's present health)						

Are you taking any medications at present? ☐ Yes ☐ No If yes, what? _____

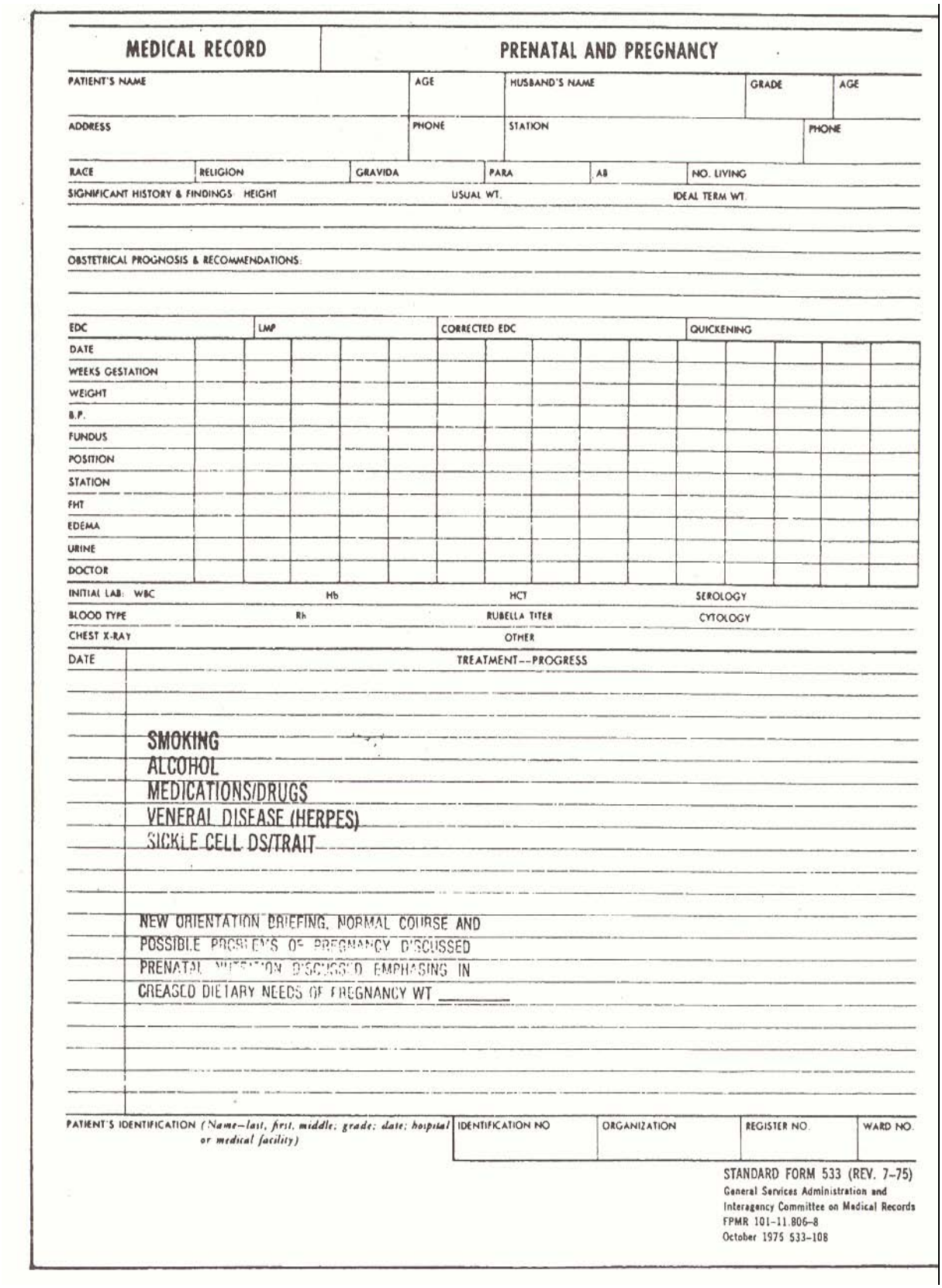
_____

Is there anything else you feel we should know? If yes, what? _____

_____

_____

Figure 6-1B. BAMC Form 287 NS, prenatal Questionnaire (back).



MEDICAL RECORD — **PRENATAL AND PREGNANCY**

PATIENT'S NAME | AGE | HUSBAND'S NAME | GRADE | AGE

ADDRESS | PHONE | STATION | PHONE

RACE | RELIGION | GRAVIDA | PARA | AB | NO. LIVING

SIGNIFICANT HISTORY & FINDINGS HEIGHT | USUAL WT. | IDEAL TERM WT.

OBSTETRICAL PROGNOSIS & RECOMMENDATIONS:

EDC | LMP | CORRECTED EDC | QUICKENING

DATE															
WEEKS GESTATION															
WEIGHT															
B.P.															
FUNDUS															
POSITION															
STATION															
FHT															
EDEMA															
URINE															
DOCTOR															

INITIAL LAB: WBC | Hb | HCT | SEROLOGY

BLOOD TYPE | Rh | RUBELLA TITER | CYTOLOGY

CHEST X-RAY | OTHER

DATE | TREATMENT--PROGRESS

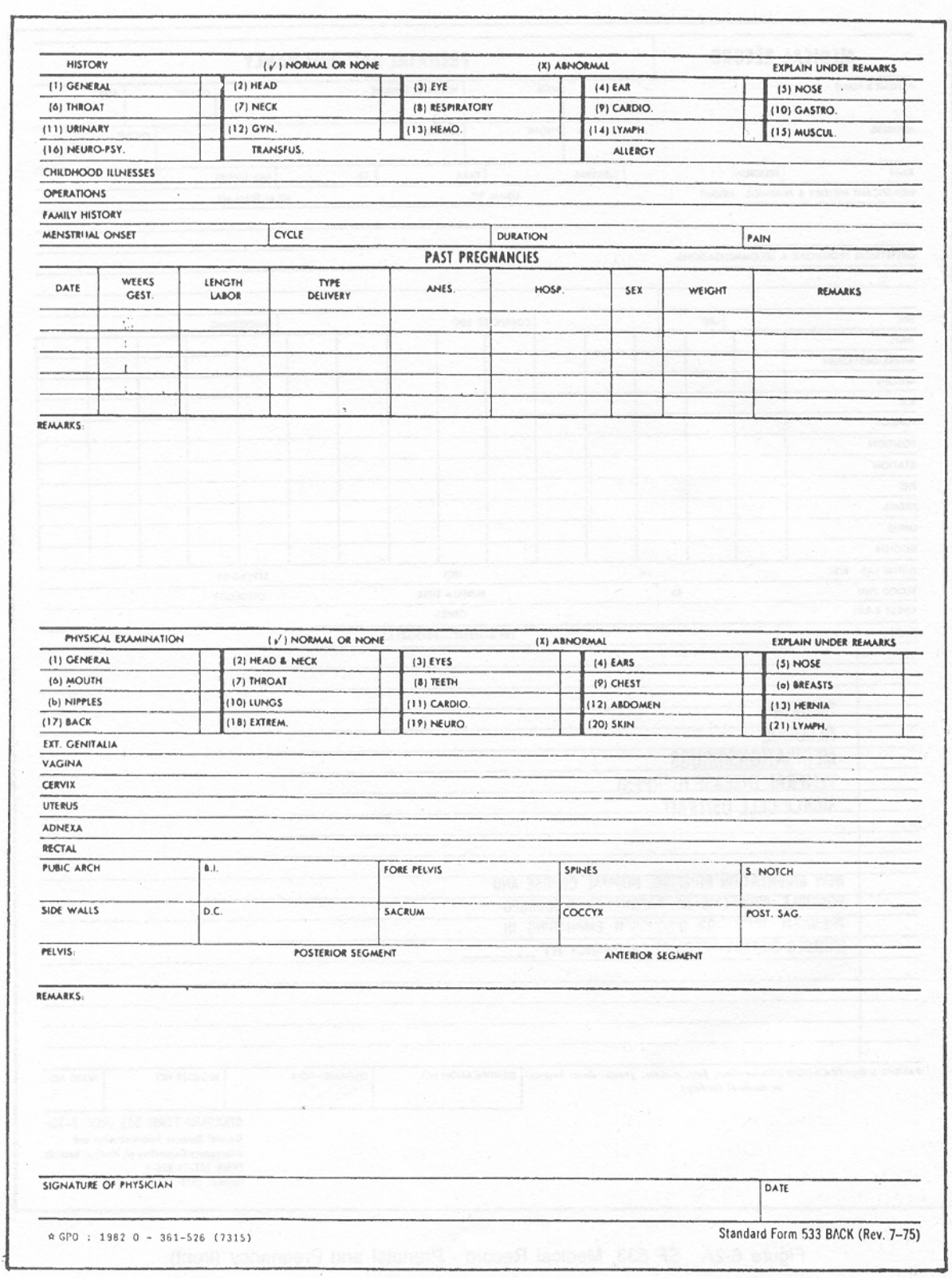
SMOKING
ALCOHOL
MEDICATIONS/DRUGS
VENERAL DISEASE (HERPES)
SICKLE CELL DS/TRAIT

NEW ORIENTATION BRIEFING, NORMAL COURSE AND
POSSIBLE PROBLEMS OF PREGNANCY DISCUSSED
PRENATAL NUTRITION DISCUSSED EMPHASING IN
CREASED DIETARY NEEDS OF PREGNANCY WT _____

PATIENT'S IDENTIFICATION *(Name–last, first, middle; grade; date; hospital or medical facility)* | IDENTIFICATION NO | ORGANIZATION | REGISTER NO. | WARD NO.

STANDARD FORM 533 (REV. 7–75)
General Services Administration and
Interagency Committee on Medical Records
FPMR 101-11.806-8
October 1975 533-108

Figure 6-2A. SF 533, Medical Record–prenatal and Pregnancy (front)



HISTORY	(✓) NORMAL OR NONE		(X) ABNORMAL			EXPLAIN UNDER REMARKS
(1) GENERAL		(2) HEAD		(3) EYE	(4) EAR	(5) NOSE
(6) THROAT		(7) NECK		(8) RESPIRATORY	(9) CARDIO.	(10) GASTRO.
(11) URINARY		(12) GYN.		(13) HEMO.	(14) LYMPH	(15) MUSCUL.
(16) NEURO-PSY.		TRANSFUS.			ALLERGY	
CHILDHOOD ILLNESSES						
OPERATIONS						
FAMILY HISTORY						
MENSTRUAL ONSET		CYCLE		DURATION		PAIN

PAST PREGNANCIES

DATE	WEEKS GEST.	LENGTH LABOR	TYPE DELIVERY	ANES.	HOSP.	SEX	WEIGHT	REMARKS

REMARKS:

PHYSICAL EXAMINATION	(✓) NORMAL OR NONE		(X) ABNORMAL			EXPLAIN UNDER REMARKS
(1) GENERAL		(2) HEAD & NECK		(3) EYES	(4) EARS	(5) NOSE
(6) MOUTH		(7) THROAT		(8) TEETH	(9) CHEST	(a) BREASTS
(b) NIPPLES		(10) LUNGS		(11) CARDIO.	(12) ABDOMEN	(13) HERNIA
(17) BACK		(18) EXTREM.		(19) NEURO.	(20) SKIN	(21) LYMPH.
EXT. GENITALIA						
VAGINA						
CERVIX						
UTERUS						
ADNEXA						
RECTAL						

PUBIC ARCH	B.I.	FORE PELVIS	SPINES	S. NOTCH
SIDE WALLS	D.C.	SACRUM	COCCYX	POST. SAG.
PELVIS:	POSTERIOR SEGMENT		ANTERIOR SEGMENT	

REMARKS:

SIGNATURE OF PHYSICIAN	DATE

☆ GPO : 1982 O - 361-526 (7315)

Standard Form 533 BACK (Rev. 7–75)

Figure 6-28B. SF 533, Medical Record–Prenetal and Pregnancy.

(3) Obstetric/gynecologic record.

(a) Last menstrual period (LMP) and menstrual history (for example, last regular cycle and spotting).

(b) Contraceptive history (Were birth control pills used? Did the patient become pregnant immediately after cessation of pills? How long after cessation of pills?

(c) Reproductive history (for example, number of previous pregnancies and their outcomes, complications).

(d) Exposure or treatment for any sexually transmitted diseases (STDs).

(e) Problems with the current pregnancy (for example, bleeding, nausea, and headaches).

(4) Present medical condition of the patient (for example, hypertension, diabetes, medications presently taking, and any drug allergies).

e. Physical examination. After a complete history is obtained, the patient is prepared for a through physical examination.

(1) Vital signs are taken to include:

(a) Temperature, pulse, respiration, and blood pressure.

(b) Fetal heart tones. Document if obtained with a doppler or fetoscope.

(2) Evaluate height, normal weight, and present weight.

(3) Obtain urine specimen. This should be obtained before the patient undresses for the pelvic examination.

(a) On the initial visit, a complete urinalysis is done.

(b) On subsequent visits, a urine specimen will be dipsticked for albumin and glucose.

(c) Additional testing will be done only if there are indications of toxemia of pregnancy or diabetes mellitus.

(4) Prepare patient for a pelvic examination, if performed.

(a) A pelvic examination is performed to confirm the pregnancy and to determine gestation. An examiner will look for signs of pregnancy--Chadwick's sign (color of cervix), Goodell's sign (softening of tip of cervix), and Hegar's sign (softening of the region between the body of the uterus and cervix). He will also evaluate the size of the uterine and the fundal height.

(b) Estimate of pelvic size. The examiner evaluates the position of the ischial spines and tuberosities. He evaluates diagonal conjugate to estimate pelvic canal size and whether it will allow passage of the fetus at the time of birth.

NOTE: One vaginal birth is not proof of adequate pelvic space for all subsequent deliveries.

(c) Palpation of pelvic contents is done to identify any abnormal masses or tumors.

(d) Nursing responsibilities.

1 Assemble necessary equipment (speculum, lubricant, spatula for cervical scraping, glass slide, culture tube with sterile cotton-tipped applicator, exam gloves, and exam light).

2 Have the patient empty her bladder so she is more comfortable. It is easier for the examiner to evaluate the size of the uterus on an empty bladder.

3 Have the patient to remove her clothing and to put on a patient gown. Allow for patient privacy while changing.

4 Position the patient on the exam table in the lithotomy position with a drape to cover her (see figure 6-3).

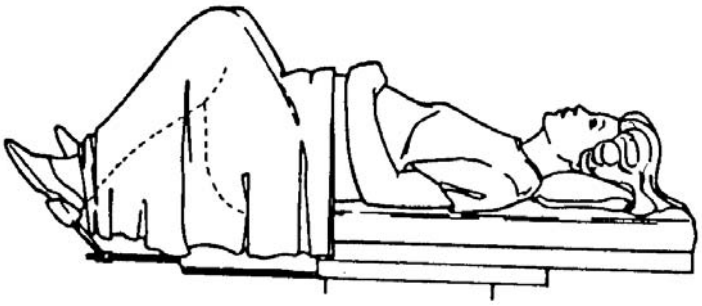


Figure 6-3. Patient in the lithotomy position, draped for pelvic exam.

5 Reassure and encourage the patient to relax during the exam. The patient can relax by taking two to three breaths and letting them out slowly through her mouth.

6 Provide wipes so the patient may remove lubricant used during the exam.

7 Allow for patient's privacy when redressing.

8 Clean up room and dispose of used materials properly.

(5) The physician will observe and palpate the patient's breast for abnormalities.

(6) A rectal exam is usually done at the end of the pelvic exam.

(7) Laboratory studies performed are as follows:

(a) CBC, Hgb, or Hct-to detect anemia.

(b) Sickle cell on black women-to identify patients with sickle cell anemia.

(c) VDRL-to identify patients with untreated syphilis.

(d) Rh factor, blood type-to determine if the patient is Rh negative.

(e) Rubella antibody titer-to determine immunity to rubella.

(f) Hepatitis screen-is done if patient history indicated cause for suspicion.

(g) HTLVIII (AIDS)-screening for AIDS may begin as a common part of the initial visit.

(8) Cultures taken at the time of the pelvic exam are as follows:

(a) Papanicolaou (PAP) Smear is done to detect any abnormalities of cell growth.

(b) Gonorrhea culture is done to screen the patient for possible infection to protect herself, her partner, and the fetus.

(c) Herpes simplex culture is done if there is a history or any lesions noted to rule out active herpes.

6-5. BASIC PATIENT TEACHING CONSIDERATIONS FOR THE EXPECTANT MOTHER ON THE FIRST PRENATAL VISIT WITH REINFORCEMENT ON EACH SUBSEQUENT VISIT

a. Instruct the patient on the importance of regularly scheduled follow-up visits (following the normal pregnancy).

(1) Once a month until the seventh month.

(2) Every two weeks during the seventh and eight month.

(3) Weekly during the ninth month until delivery.

(4) Patient teaching must continue on each visit.

b. Instruct the patient on the importance of proper nutrition.

(1) A well-nourished mother and baby are thought to be far less the victims of obstetric and prenatal complications, such as:

(a) Preeclampsia.

(b) Prematurity.

(c) Growth retardation.

(d) Significant residual neurologic damage (that is, cerebral palsy, mental deficiency, or behavior disorders in the child).

(2) Guide to good eating-from the six basic food groups daily (see figure 6-4).

(a) Milk, yogurt, and cheese group-2 to 3 servings per day.

(b) Meat, poultry, fish, beans, eggs, and nuts group-2 to 3 servings per day.

(c) Vegetable and fruits-3 to 5 servings of vegetables and 2 to 4 servings of fruits per day.

(d) Breads, cereals, rice and pasta- 6 to 11 servings per day.

(3) Proper weight gain for pregnancy. After an initial loss, the patient will gain 2 to 4 pounds during the first trimester. Expect a gain of a pound per week during the second and third trimesters.

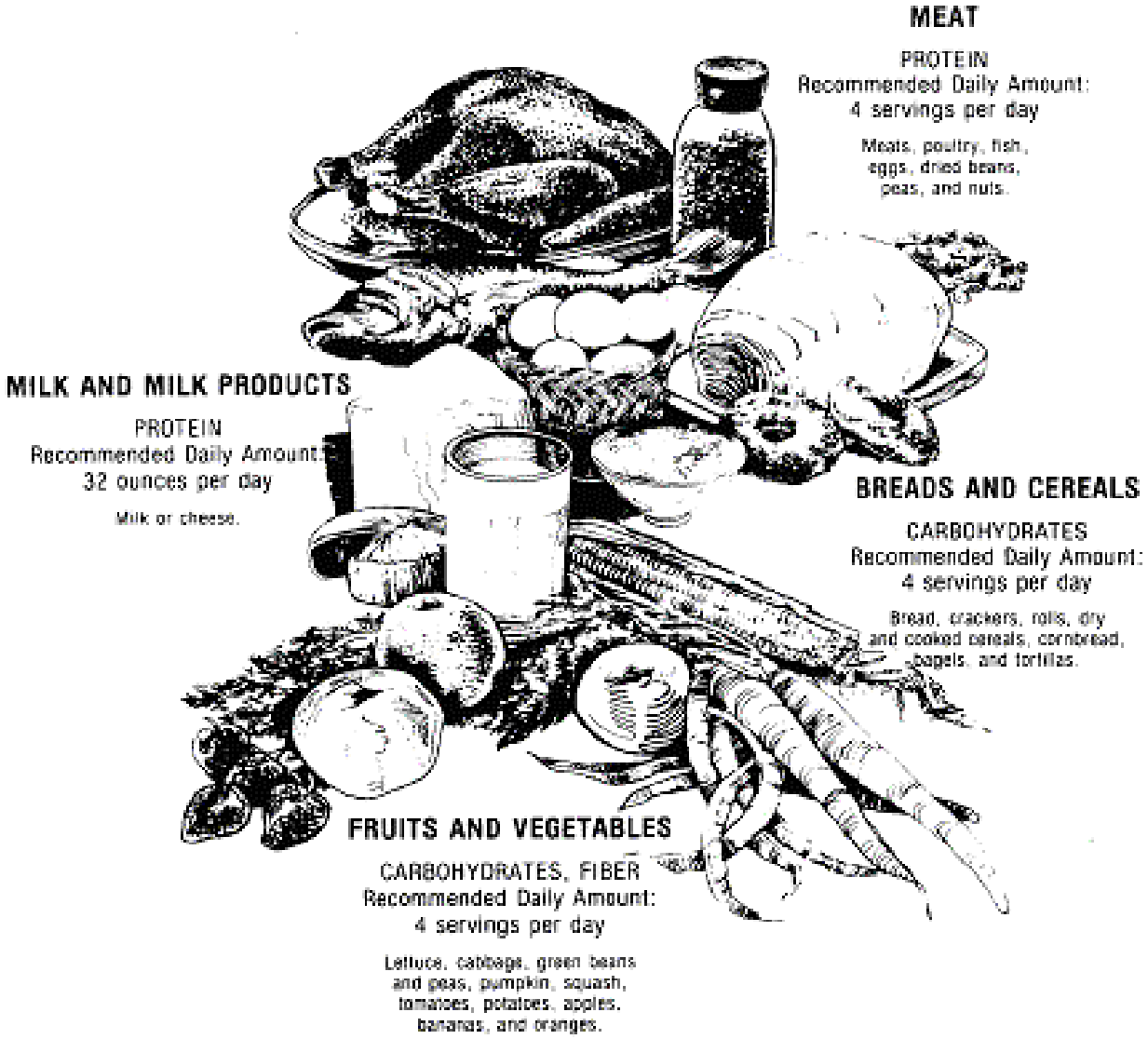

MEAT
PROTEIN
Recommended Daily Amount:
4 servings per day
Meats, poultry, fish, eggs, dried beans, peas, and nuts.
MILK AND MILK PRODUCTS
PROTEIN
Recommended Daily Amount:
32 ounces per day
Milk or cheese.
BREADS AND CEREALS
CARBOHYDRATES
Recommended Daily Amount:
4 servings per day
Bread, crackers, rolls, dry and cooked cereals, cornbread, bagels, and tortillas.
FRUITS AND VEGETABLES
CARBOHYDRATES, FIBER
Recommended Daily Amount:
4 servings per day
Lettuce, cabbage, green beans and peas, pumpkin, squash, tomatoes, potatoes, apples, bananas, and oranges.

Figure 6-4. Four basic food groups.

c. Instruct the patient on the importance of proper rest and sleep.

(1) Pregnancy will cause the patient to tire more easily.

(2) Prevention of fatigue through short rest periods is vital to good health.

(3) The amount of rest or sleep required will vary with the individual and stage of her pregnancy.

d. Instruct the patient on the importance of exercise and fresh air.

(1) The degree will vary according to her condition and stage of pregnancy.

(2) Walking is usually the exercise of choice.

(3) Swimming is an excellent overall exercise program.

e. Instruct the patient on precautions to take during pregnancy.

(1) Decrease smoking or stop altogether if possible.

(2) Restrict or limit alcohol intake.

(3) Avoid children with measles or other contagious diseases.

(4) Do not change kitty litter boxes or eat raw meats to prevent toxoplasmosis.

f. Instruct the patient on potential danger signs of pregnancy that would necessitate her contacting her physician and coming in.

(1) Any vaginal bleeding, regardless of how small, may indicate possible miscarriage or abortion, placenta previa, or placenta abruptio (see figures 6-5 and 6-6).

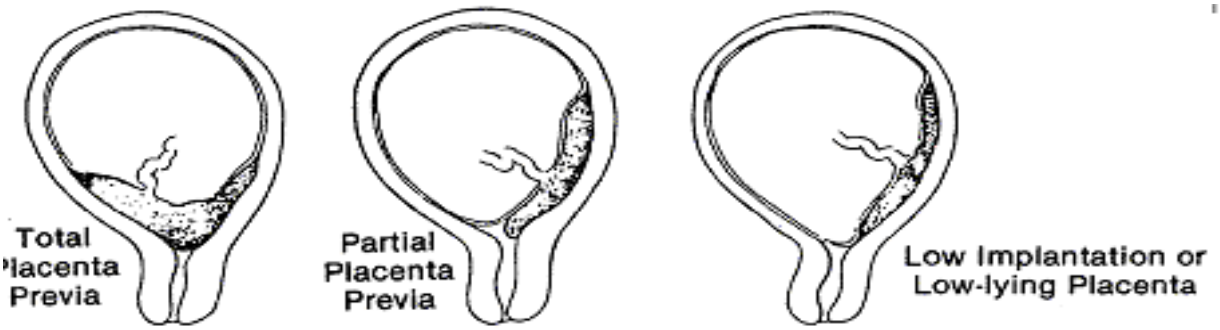


Figure 6-5. Various degrees of placenta previa.

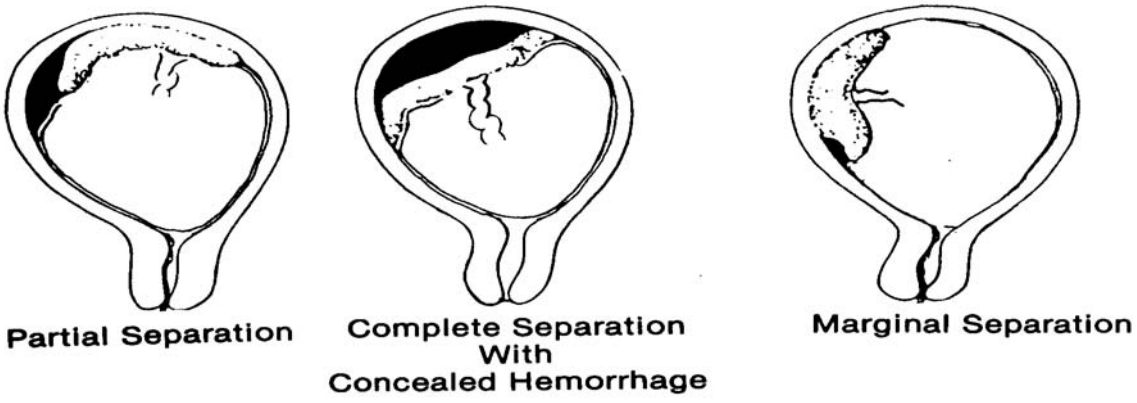


Figure 6-6. Various degrees of placenta abruptio.

(2) Symptoms that may indicate preeclampsia. The symptoms are:

(a) Severe continuous headache.

(b) Dimness or blurring of vision.

(c) Swelling of the face or hands, especially when present after resting all night.

(d) Scotoma- lashes of lights or dots before the eyes.

(e) Persistent vomiting.

(f) Sharp pain in the abdomen.

(g) Epigastric pain.

(h) Weight gain greater than 4 pounds in one week.

(i) Chills and fever.

(j) Burning upon urination.

(k) Sudden escape of fluid from the vagina. The patient should report immediately to the physician or the hospital. She should not wait for uterine contractions to start.

(l) Lack of fetal movement over a 24-hour period once "quickening" has been established.

(m) Regular uterine contractions less than 5 minutes apart for an hour for anyone less than 37 weeks pregnancy.

Continue with Exercises

EXERCISES, LESSON 6

INSTRUCTIONS: Answer the following exercises by marking the lettered response that best answers the exercise, by completing the incomplete statement, or by writing the answer in the space(s) provided.

After you have completed all of these exercises, turn to "Solutions to Exercises" at the end of the lesson and check your answers. For each exercise answered incorrectly, reread the material referenced with the solution.

1. Physicians, nursing personnel, dieticians, and occupational therapists are all considered _____.

2. _____ refers to the medical and nursing supervision and care given to the pregnant patient during the period between conception and the onset of labor.

3. Why is "early care" essential for a pregnant woman?

   _____.

4. List the four categories of information obtained for a pregnant patient's medical/obstetrical history.

   _____.

   _____.

   _____.

   _____.

5. During the expectant's mother physical exam, her temperature, pulse, respiration, and blood pressure are taken to include the:

   _____.

6. Why should a woman empty her bladder before a pelvic examination?

_____

_____.

7. When is a rectal exam usually performed on a patient?

_____.

8. List the regular scheduled follow-up visits of the expectant mother following normal pregnancy.

_____.

_____.

_____.

9. As a guide to good eating, the expectant mother should eat from the six basic food groups daily. Fill in the blank opposite each of the food groups listed to indicate the number of servings per day.

Bread, cereals, rice, and pasta	_____ servings per day.
Milk, yogurt, and cheese	_____ servings per day.
Meat, poultry, fish, beans, eggs, and nuts	_____ servings per day.
Vegetables and fruits	_____ servings per day.

10. _____ may indicate possible miscarriage or abortion, placenta abruptio, or placenta previa.

11. List 5 of the 7 potential danger signs of pregnancy that would cause the pregnant patient to call her physician or to go in.

_____.

_____.

_____.

_____.

_____.

Check Your Answers on Next Page

SOLUTIONS TO EXERCISES, LESSON 6

1. health care professionals (para 6-3c).

2. antepartal or prenatal care (para 6-3a).

3 . To avoid unnecessary risk for herself and her fetus. (para 6-3e).

4. Past medical history to the patient's mother and father.
   Family illnesses.
   Obstetric/gynecologic record.
   Present medical conditions of the patient. (para 6-4d(1),(2),(3),(4)).

5. fetal heart tones. (para 6-4e(1)).

6. So that she (the patient) is more comfortable and to make it easier for the examiner to evaluate the size of the uterus. (para 6-4e(4)(d)2).

7. After the pelvic exam. (para 6-4e(6)).

8. Once a month until the 7th month.
   Every two weeks during the 7th and 8th months.
   Weekly during the 9th month until delivery. (para 6-5a).

9.

Bread, cereals, rice, and pasta	6 to 11 servings per day.
Milk, yogurt, and cheese.	2 to 3 servings per day.
Meat, poultry, fish, beans, eggs, and nuts.	2 to 3 servings per day.
Vegetables and fruits	3 to 5 servings of vegetables and 2 to 4 servings of fruits per day. (para 6-5b(2)).

10. vaginal bleeding. (para 6-5f(1))

11. (any 5)
Any vaginal bleeding.
Preeclampsia symptoms.
Chills and fever.
Burning upon urination.
Sudden escape of fluid from the vagina.
Lack of fetal movement over a 24-hour period once quickening has been established.
Regular uterine contractions less than 5 minutes apart for an hour for anyone less than 37 week of pregnancy. (para 6-5f)

End of Lesson 6

LESSON ASSIGNMENT

LESSON 7	Personal Hygiene and Care During Pregnancy.
TEXT ASSIGNMENT	Paragraphs 7-1 through 7-4.
LESSON OBJECTIVES	After completing this lesson, you should be able to:

7-1. Identify personal hygiene considerations needed during pregnancy.

7-2. Identify activity modifications needed as a result of pregnancy.

7-3. Identify descriptive statements referring to the purpose and factors, which determine the type and amount of exercises performed by the pregnant woman.

SUGGESTION After studying the assignment, complete the exercises at the end of this lesson. These exercises will help you to achieve the lesson objectives.

LESSON 7

PERSONAL HYGIENE AND CARE DURING PREGNANCY

7-1. GENERAL

Your knowledge about personal hygiene and care of the pregnant patient will help to make her feel comfortable with her own body and less anxious about the effects of external substances on her developing fetus. Some modifications of certain activities may be required. This lesson will cover health concepts, which should be taught to the pregnant patient so that she may be able to enjoy her pregnancy to the fullest while still providing care for a healthy baby.

7-2. PERSONAL HYGIENE DURING PREGNANCY

As a practical nurse, you have the opportunity to assist the expectant mother in attaining healthier patterns of living and to reinforce health-promoting behaviors. Skin care, hair care, breast care, dental care, bowel elimination, vaginal douching, and clothing are all important to the pregnant patient.

a. **Skin Care**. The glands of the skin may be more active during pregnancy and the patient may tend to perspire more. Frequent baths or showers are recommended.

(1) Baths can be therapeutic--relaxes tensed and tired muscles, helps counter insomnia, and makes the patient feel fresh and sweet smelling.

(2) Baths may pose a physical maneuverability problem which increases the chance of falling late in the pregnancy; showers are recommended, but with caution when getting in and out and moving around in the shower.

(3) The possibility of infecting the vaginal tract as a result of tub baths is considered highly unlikely.

(4) Tub baths are contraindicated after rupture of the membranes.

b. **Hair Care**. The hair tends to become oily more frequently during pregnancy due to overactivity of oil glands of the scalp and may require shampooing more frequently. The hair may grow faster during pregnancy and may require cutting more often.

c. **Breast Care**. It is important to begin preparing the breast for breastfeeding during the prenatal period.

(1) A well-fitting support bra should be worn at all times. This will provide good support for the enlarging breasts. As the breasts enlarge, an increase in bra and cup size should be worn.

(2) Pads may be worn inside the bra cups to absorb possible colostrum leakage from the nipples. The pads should be changed if they become wet from leakage. Prolonged moisture against the nipples may lead to tenderness and cracking once the newborn infant begins nursing.

(3) The breasts should be washed daily (without soap) to remove dried colostrum and to prevent irritation to the nipples. Lanolin may be applied to the nipples to prevent evaporation of perspiration, thereby softening the skin. Wet tea bags may be placed on the nipples, as the tea will release tannic acid, which will toughen the skin. The nipples should be air dried or blow dried after washing to help toughen them, especially if the patient plans to breastfeed.

d. **Dental Care**. The patient must maintain normal, daily dental care. There is no documentation that supports increased dental cavities during pregnancy.

(1) Minor dental work, such as fillings and simple extractions, may be done during pregnancy; however, patients are advised to avoid anesthetics.

(2) Major dental work, to include all dental surgery, should be postponed until after the pregnancy because of the need to use anesthetics. Anesthetics may affect the developing fetus and the need to use analgesics may also affect the fetus.

e. **Bowel Elimination**.

(1) Patients who normally had no problems with bowel elimination habits will usually experience little or no change in the daily routine.

(2) Patients who have a tendency toward constipation become noticeably more irregular during pregnancy because of:

(a) Decreased physical exertion.

(b) Relaxation of bowel as a response to hormone.

(c) Pressure on the bowel from the gravid uterus.

(d) Constipating effect of iron supplements.

(3) To prevent or to relieve constipation, you should encourage the patient to eat a diet high in fiber, maintain an adequate fluid intake, and to exercise--especially walking.

f. **Vaginal Douching**. Explain to the patient that normal vaginal secretions are usually intensified during pregnancy due to increased circulation and hormone.

(1) Vaginal douching should only be done with a physician's order for treatment of a specific condition. There is potential for introduction of infection and development of an air embolism.

(2) Vaginal douching should never be done after a rupture or even suspected rupture of the membrane.

(3) Feminine hygiene deodorant sprays should not be used due to increased chance of perineal irritation, cystitis, and urethritis. Undesirable odors can be controlled with daily use of soap and water.

(4) If a douche is ordered, it should be done slowly using a gravity bag. Bulb syringe and "squeeze" operated pre-packaged douches should be avoided, as they are capable of producing too much force.

(a) Douche while sitting on a toilet to decrease the risk of injury by falling.

(b) The tip is not to be inserted deeper than 3 inches.

(c) The bag should not be higher than 2 feet above the level of the vagina. The bag higher than 2 feet above will increase the force of pressure.

g. **Clothing**. During pregnancy, the clothes should be given the same or perhaps even a little more attention than at other times.

(1) The clothes should be lightweight, nonconstructive, adjustable, absorbent, and enhance the sense of well-being of the patient.

(2) No constrictive round garters or girdles should be used due to interference in the blood's circulation from the legs.

(3) The shoes should be comfortable and well-fitting, easy to apply, especially in the last trimester when it is difficult to bend over to tie or buckle. They should also have a good solid base of support (broad heel) to avoid tottering, which may lead to a fall.

7-3. ACTIVITY MODIFICATIONS DURING PREGNANCY

Goals of modified activity during pregnancy are to promote health of the patient and the fetus, to provide relaxation and diversion, to promote or continue good muscle tone, and to prevent muscle atrophy.

a. **Employment**.

(1) Many patients continue to work throughout pregnancy. Whether she can or should continue to work depends on the physical activity involved, the industrial

hazards, toxic environment (chemical dust particles, gases, such as inhalation anesthesia), medical or obstetrical complications, or employment regulations of the company.

(2) Activities that are dependent on a good sense of balance should be discouraged, especially during the last half of pregnancy.

(3) Excessive fatigue is usually the reason for employment termination. This may be prevented by modification of the job requirements temporarily and adequate rest periods during the day.

(4) Patients who have sedentary jobs need to walk around at intervals and should never sit or stand in one position for long periods. Chairs should provide adequate back support. A footstool can help prevent pressure on veins, relieve strain on varices, and minimize swelling of the feet.

b. **Travel**. This is perhaps a detail of prenatal care, which most patients think very little about, unless they have a tendency to become nauseated or have had a previous miscarriage, which precludes any extensive strain. Traveling should be discussed with the physician, even though there is little restriction on travel from a medical point of view. Extensive trips should be approved by the physician.

(1) Traveling is not a cause of abortion or premature labor.

(2) Lowered oxygen levels may cause fetal hypoxia in high-altitude regions.

(3) Fatigue or tension are primary problems due to change in personal habits and diets. The patient should take frequent rest periods; stop and walk around every two hours if traveling by auto. Drink plenty of fluids to prevent dehydration. These steps will help prevent fatigue, relieve tension, and increase circulation.

(4) Consider traveling by air for long trips to reduce travel time.

(5) Wear seat belts at all times (see figure 7-1).

Figure 7-1. Seat belt wear.

c. **Sexual Relations**.

(1) It has been suggested, but not proven, that premature delivery may be induced by the effect of oxytocin released during maternal response of organs, orgasmic contractions, and prostaglandin in the male ejaculate.

(2) There are no restrictions on sexual intercourse during pregnancy except for those patients who have a history of ruptured membranes, vaginal spotting, or have been treated for preterm labor during this pregnancy.

(3) Patients with a history of repeated abortions may be advised to avoid intercourse during the period of gestation when previous abortions occurred.

(4) Modifications in regard to sexual positions may be required as the pregnancy progresses.

(5) Patients or couples should also be cautioned against masturbatory activities when orgasmic contractions are contraindicated. Studies have shown that orgasm is often more intense when induced by masturbation. The fetal heart rate decreases during orgasm. Fetal distress has not yet been noted.

d. **Alcohol Consumption**. Studies now support that alcohol should be avoided during pregnancy to prevent the possibility of fetal alcohol syndrome, which includes growth retardation, mental deficiency, and craniofacial or musculoskeletal abnormalities. It is now believed that as little as one to three ounces of alcohol per day may be dangerous.

e. **Smoking**.

(1) Smoking, or frequent exposure to a smoke-filled environment is harmful to the fetus. Smoking causes vasoconstriction of the blood vessels to include those of the placenta. It also decreases oxygen and nutrients to the infant.

(2) There is direct correlation between smoking and low infant birth weight. There is a tendency toward depressed growth and low weight gain to continue even after birth.

(3) There is an increased number of upper respiratory infections in the infant during the first year of life.

f. **Exercise**. During pregnancy, exercise is vital for good maternal health, healthy birth, and recovery. Exercise has been proven to be safe and healthful as long as the patient feels comfortable doing them. Physical exercise helps a patient adjust to the hormonal and physical change of pregnancy as well as the emotional and psychological changes. Exercise provides extra support for the growing baby by strengthening abdominal muscles as well as muscles supporting the backbone and the pelvic floor (areas under great stress in pregnancy).

(1) Moderate exercise is recommended. Activities continued to a point of exhaustion or fatigue compromises uterine profusion and fetoplacental oxygenation. These activities are discouraged.

(2) As pregnancy continues, the center of gravity changes so the patient may become clumsy and increase the risk of injury. The amount of exercise is dependent on the health, previous exercise habits, and obstetric history of the individual.

(a) Curtailing an exercise pattern of a previously active patient may be a negative factor in her physical, emotional, and mental health.

(b) Most patients may continue their pre-pregnancy exercise program as long as the pregnancy remains normal.

(3) Once the pregnancy has been confirmed is, however, not the time to start a new exercise program.

7-4. PRENATAL EXERCISES

a. Prenatal exercises promote comfort and maintain or increase muscle tone. Factors that determine the type and amount of exercise recommended depends on the individual's, need, the patient's general physical condition during pregnancy, and the current stage of pregnancy.

b. Specific prenatal exercises includes tailor sitting, pelvic rocking, abdominal muscle contractions, Kegel exercise, and squatting.

(1) Tailor sitting (see figrue 7-2). This exercise stretches the perineal muscles and strengthens the thigh muscles. The patient should:

(a) Sit flat on the floor with legs outstretched; knees are gently pushed to the floor until the perineal muscles begin to stretch.

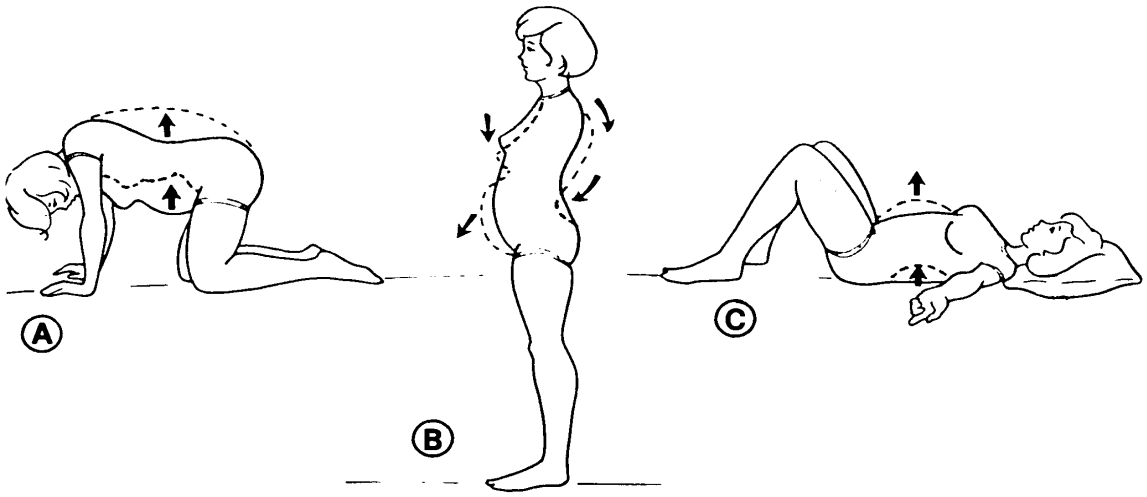
(b) Hold this position for increased amounts of time each time performed.

Figure 7-2. Tailor sitting exercise.

(2) Pelvic rocking (see figure 7-3). This exercise stretches the back muscles and helps to alleviate backache. The patient should:

(a) Get on all fours by hollowing the back and then arching it upward to form a mound. This may also be done by lying on her back or standing up.

(b) Thrust back outward with buttocks tucked under. Hold for at least 3 seconds and release. Repeat 5 times.



A. On all fours. B. Standing. C. Lying on back.

Figure 7-3. Pelvic rocking exercise.

(3) Abdominal muscle contractions (see figure 7-4). This exercise strengthens the abdominal muscles, which assist in effective pushing during the second stage of labor, and helps regain abdominal shape following delivery. The patient should:

(a) Contract and relax the muscles of the abdomen.

(b) Repeat as often as desired and gradually increase the time held.

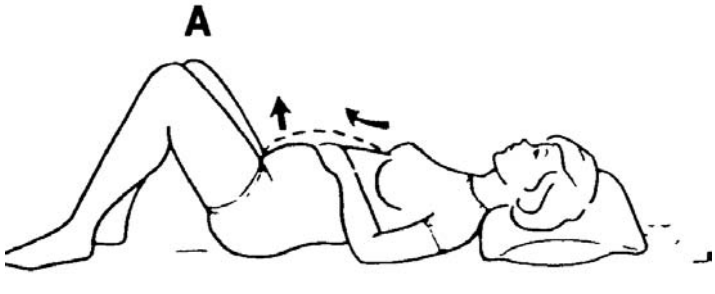


Figure 7-4. Abdominal muscle contractions exercise.

(4) Squatting (see figure 7-5). The exercise stretches the perineal muscles. The patient must squat and keep her feet flat on the floor. Do this 15 minutes per day.

Figure 7-5. Squatting exercise.

NOTE: The perineum is the skin-covered muscular area between the vaginal opening and the anus.

(5) Kegel exercise-pelvic floor contractions (see figure 7-6). This exercise strengthens the muscles of the perineal floor. The patient should alternate between tightening and relaxing the perineal muscles. This can be done at any time and should be repeated 75 to 100 times per day.

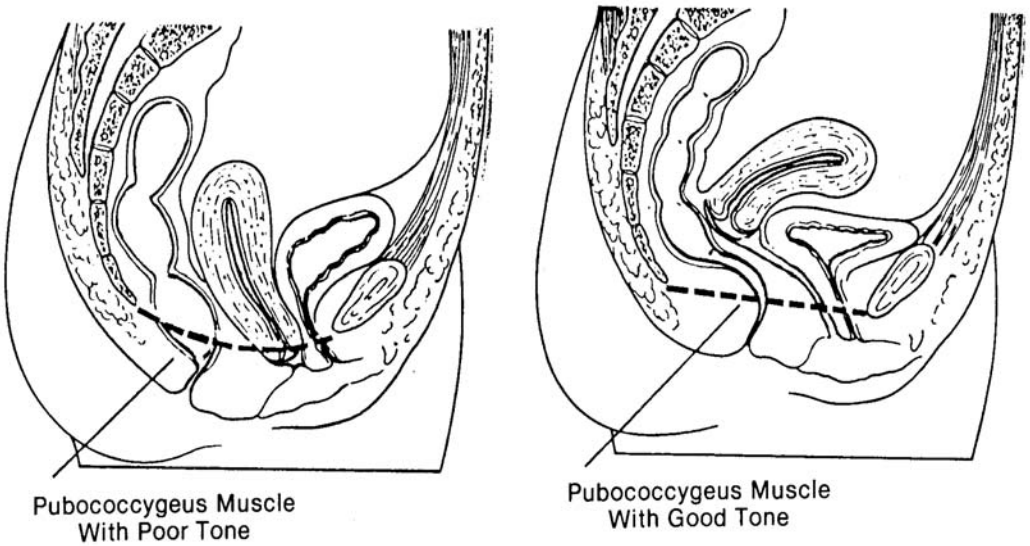


Figure 7-6. Muscles of the perineal area.

Continue with Exercises

EXERCISES, LESSON 7

INSTRUCTIONS: Answer the following exercises by marking the lettered response that best answers the exercise, by completing the incomplete statement, or by writing the answer in the space(s) provided.

After you have completed all of these exercises, turn to "Solutions to Exercises" at the end of the lesson and check your answers. For each exercise answered incorrectly, reread the material referenced with the solution.

1. Personal hygiene during pregnancy is very important to the expectant mother. What areas of concentration are of great concern as discussed in this lesson?

   _____.

   _____.

   _____.

   _____.

   _____.

   _____.

   _____.

2. The expectant mother should take frequent rest stops when traveling by: _____.

3. Why should pads be worn inside the bra cups?

   _____.

4. _____ dental work may be done during pregnancy. These include fillings and simple extractions.

5. Restrictions on sexual intercourse during pregnancy apply to patients who have been treated for preterm labor during this pregnancy, who have: _____ or _____.

For items 6 through 15. The following statements/phrases may be true or false pertaining to the pregnant woman.

6. Vaginal douching should only be done with a physician's order.

   a. True.

   b. False.

7. Clothing should be heavyweight, constrictive, and nonabsorbent.

   a. True.

   b. False.

8. Encourage the patient to eat high fiber foods and to drink plenty of fluid in order to prevent or to relieve constipation.

   a. True.

   b. False.

9 . The breast should be washed daily with soap to remove dried colostrum.

   a. True.

   b. False.

10. Major dental surgery should be postponed until after surgery.

   a. True.

   b. False.

11. Baths can be therapeutic.

    a. True.

    b. False.

12. The hair tends not to grow during pregnancy.

    a. True.

    b. False.

13. Activities that are dependent on a good sense of balance should be discouraged especially during the third trimester.

    a. True.

    b. False.

14. Seat belts should never be worn during pregnancy.

    a. True.

    b. False.

15. Alcohol consumption can lead to the possibility of fetal alcohol syndrome.

    a. True.

    b. False.

For exercises 16 through 20. Match the type of exercise in Column A with the correct associated phrase as listed in Column B. Place the letter of the correct phrase in the sp

COLUMN A	**COLUMN B**
___16. Squatting	a This exercise assists in effective pushing during the second stage of labor.
___17. Kegel exercise	b. Stretches the perineal muscles and strengthens the thigh.
___18. Abdominal muscles contractions	c. Stretches the perineal muscles and is e done with the feet flat on the floor.
___19. Tailor sitting	d. Get on all fours by hollowing the back and then arching it upward to form a mound.
___20. Pelvic rocking	e. Should be done 75 to 100 times

Check Your Answers on Next Page

SOLUTIONS TO EXERCISES, LESSON 7

1. skin care.
   hair care.
   breast care .
   dental care .
   bowel elimination.
   vaginal douching.
   clothing. (para 7-2)

2. an auto (para 7-3c(3))

3. To absorb possible colostrum leakage from the nipples. (para 7-2c(2))

4. minor (para 7-2d(1))

5. A history of ruptured membranes or vaginal spotting. (para 7-3c(2))

6. a (para 7-2f(1)).

7. b (para 7-2g(1)).

8. a (para 7-2e(3)).

9. b (para 7-2c(3)).

10. a (para 7-2d(2).)

11. a (para 7-2a(1)).

12. b (para 7-2b).

13. a (para 7-3a(2)).

14. b (para 7-3b(5)).

15. a (para 7-3d).

16. c (para 7-4b(4)).

17. e (para 7-4b(5)).

18. a (para 7-4b(3)).

19. b (para 7-4b(1))

20. d (para 7-4b(2))

End of Lesson 7

LESSON ASSIGNMENT

LESSON 8	Minor Discomforts of Pregnancy.
TEXT ASSIGNMENT	Paragraphs 8-1 through 8-7.
LESSON OBJECTIVES	After completing this lesson, you should be able to:

8-1. Identify the minor discomforts of specific body systems of the pregnant patient.

8-2. Identify the causes of the minor discomforts of pregnancy.

8-3. Identify the nursing interventions when caring for a pregnant patient suffering from the minor discomforts of pregnancy.

SUGGESTION After studying the assignment, complete the exercises at the end of this lesson. These exercises will help you to achieve the lesson objectives.

LESSON 8

MINOR DISCOMFORTS OF PREGNANCY

8-1. GENERAL

The practical nurse is an invaluable member of the health care team when working with pregnant patients. Being knowledgeable and capable to support the patient and to give her advice to make her more comfortable is very important during the pregnancy. Since the patient is carrying a new life within her, her body must make certain adaptations to his presence. These adaptations of the body can be very annoying, and by your intervention, you may help the new pregnant patient to carry her pregnancy more comfortably and safely. Do be aware that all patients do not experience all of the discomforts (Table 8-1) and some patients pass through the entire antepartal period without any complications of this type.

8-2. DISCOMFORTS RELATED TO THE GASTROINTESTINAL SYSTEM

a. **Nausea and Vomiting (Morning Sickness)**.

(1) One of the most common discomforts of early pregnancy is possibly due to high levels of humanchorionic gonadotropin (HCG) or progesterone, cultural expectations, emotional factors, and hypoglycemic reaction as a result of increased basal metabolism due to the 24-hour a day fetal and maternal body functions, especially after a period of fasting (from night to morning).

(2) Nausea and vomiting usually appear early in the first trimester (6 to 8 weeks) and subsides by the end of the 12th week of pregnancy.

(3) This is most bothersome in the morning when a woman awakes and the stomach is empty. Some pregnant women may experience this sort of discomfort at other times of the day.

(4) Nursing interventions consist of advising the mother to:

(a) Eat a high-protein snack at bedtime if it's a hypoglycemic attack.

(b) Eat crackers or a piece of dry toast before getting up (keep by bedside if possible).

(c) Eat frequently spaced, small meals of high-quality (protein) foods.

(d) Sip a hot drink before arising.

DISCOMFORTS OF THE BODY SYSTEMS		
Gastrointestinal System	**Musculoskeletal System**	**Cardiovascular System**
Nausea and Vomiting Heartburn Constipation	Backache Muscle Cramps	Supine Hypotension Varicose Veins Edema
Respiratory System	**Reproductive System**	**Urinary System**
Dyspnea Nasal Stuffiness	Leukorrhea Braxton Hicks Contractions	Urinary Frequency and Urgency Stress Incontinence

Table 8-1. Minor discomforts of the body systems.

b. **Heartburn (Pyrosis)**.

(1) Heartburn is a burning sensation in the epigastric and sternal region. It results from relaxation of the cardiac sphincter and the decreased tone and mobility of smooth muscles which is due to increased progesterone thereby allowing for esophageal regurgitation, decreased emptying time of the stomach, and reverse peristalsis.

(2) Nursing interventions consist of advising the patient to:

(a) Eat frequent, small meals.

(b) Take sips of milk or hot tea.

(c) Eat slowly.

(d) Avoid fatty and gas-forming foods.

(e) Maintain good posture to give the gastrointestinal tract lots of space.

(f) Do <u>not</u> lie down after eating.

c. **Constipation**.

(1) The gastrointestinal tract motility is slowed due to increased progesterone resulting in increased reabsorption of water and drying of stool; and compression of the intestines by the enlarging uterus.

(2) Predisposition to constipation due to oral iron supplement (side effect of iron therapy is constipation). Some patients respond with diarrhea.

(3) Nursing intervention consists of advising the patient to:

(a) Drink at least six glasses of water per day.

(b) Increase roughage in the diet (for example, bran, coarse ground cereals, and fresh fruits and vegetables with skins).

(c) Do moderate exercise every day, especially walking.

(d) Maintain a regular schedule for bowel movements.

(e) Utilize deep breathing and relaxation techniques.

8-3. DISCOMFORTS RELATED TO THE MUSCULOSKELETAL SYSTEM

a. **Backache**.

(1) Backache is caused by relaxation of the sacroiliac joint which is due to increased hormones (steroid sex hormone and relaxing) resulting in slight joint and muscle relaxation and increased mobility; and exaggerated lumbar and cervico thoracic curves caused by changes in the center of gravity from the enlarging abdomen and breasts.

(2) Prevention of strain, which can cause backache, should begin early in pregnancy.

(3) Nursing interventions consist of advising the patient:

(a) That maternity girdles are no longer recommended.

(b) To practice good posture and good body mechanics (use the pelvic tilt and bend at the knees).

(c) To wear appropriate, well-fitting shoes.

(d) To sleep on a firm mattress or backboard.

(e) That backaches may indicate a kidney or bladder infection. The patient must inform the physician of backache problems. Backaches should be carefully evaluated.

b. **Muscle Cramps**.

(1) Muscle cramps are caused by:

(a) Compression of nerves supplying the lower extremities due to the enlarging uterus.

(b) Reduced level of diffusible serum calcium or elevation of serum phosphorus in the bloodstream.

(c) Fatigue, chilling, or tense body posture.

(2) Muscle cramps are not considered a serious condition, but they may be quite painful.

(3) Nursing interventions consists of advising the patient to:

(a) Avoid fatigue and cold legs.

(b) Eat a diet with adequate calcium or prescribed calcium.

(c) Avoid drinking more than one (1) quart of milk per day. More than one quart of milk per day will create too much phosphorus in the system.

(d) Take the prescribed vitamins B and D per doctor's instructions.

(4) Treatment during muscle cramps.

(a) The patient should lie on her back and extend the affected limb. A second individual should apply pressure on the patient's knee with one hand and sharply flex the foot with the other hand (see figure 8-1). The affected muscle may also be kneaded with the heel or palm of the hand.

(b) Heat may be applied to the area of the muscle cramp.

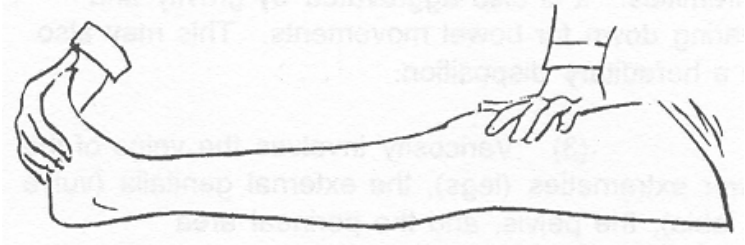


Figure 8-1. Relief of muscle cramp.

8-4. DISCOMFORTS RELATED TO THE CARDIOVASCULAR SYSTEM

a. **Supine Hypotension (Vena Cava Syndrome) (See figure 8-2)**.

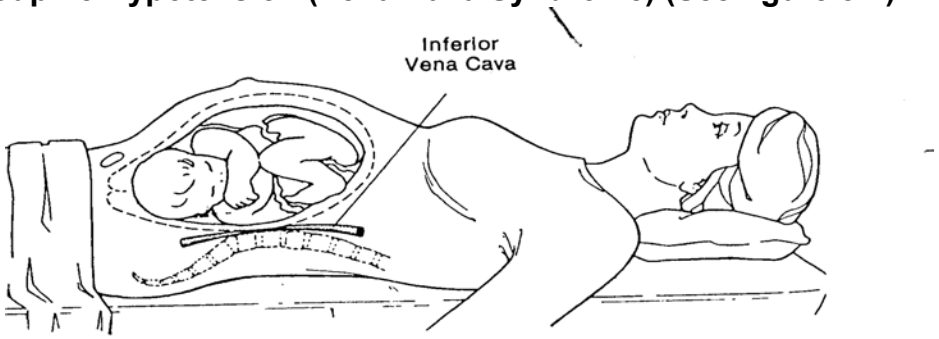


Figure 8-2. Supine hypotension (Vena cava syndrome).

(1) Supine hypotension is caused by pressure of the gravid uterus on the ascending vena cava when the woman is supine which decreases the return of the blood.

(2) Symptoms include nausea, cold and clammy, feels faint, and hypotensive (decreased blood pressure).

(3) Nursing interventions consist of advising the patient to:

(a) Get up slowly.

(b) Use the side-lying position, preferably on the left side.

b. **Varicose Veins**.

(1) Varicosity is an enlargement of the lumen of a vein due to thinning and stretching of its walls.

(2) It is caused by the relaxation of smooth muscle walls of veins, which is due to increased hormones (progesterone), which causes pelvic vasocongestion. This condition is aggravated during pregnancy due to the enlarging uterus in the pelvis causing pressure on the great abdominal veins, which interferes with return blood flow from the lower extremities. It is also aggravated by gravity and bearing down for bowel movements. This may also be a hereditary disposition.

(3) Varicosity involves the veins of the lower extremeties (legs), the external genitalia (vulva or labia), the pelvis, and the perineal area (hemorrhoids).

(4) Nursing intervention consists of advising the patient to:

(a) Avoid obesity.

(b) Avoid lengthy standing or sitting.

(c) Avoid constrictive clothing.

(d) Avoid constipation and bearing down.

(e) Elevate legs when sitting.

(f) Get adequate rest.

(g) Perform moderate exercise.

(5) Treatment once varicose veins have developed.

(a) Rest with legs and hips elevated.

(b) Wear support stockings before rising (getting up) if varicose veins are severe.

(c) Lie on the bed with legs extended at a right angel to the body if ordered by the physician (see figure 8-3 A).

(d) If in the vulva, may be relieved by placing a pillow under the buttocks to elevate the hips, assuming the Sim's position (see figure 8-3 B) for a few minutes several times a day, avoid standing as much as possible, or laying down instead of sitting when practical.

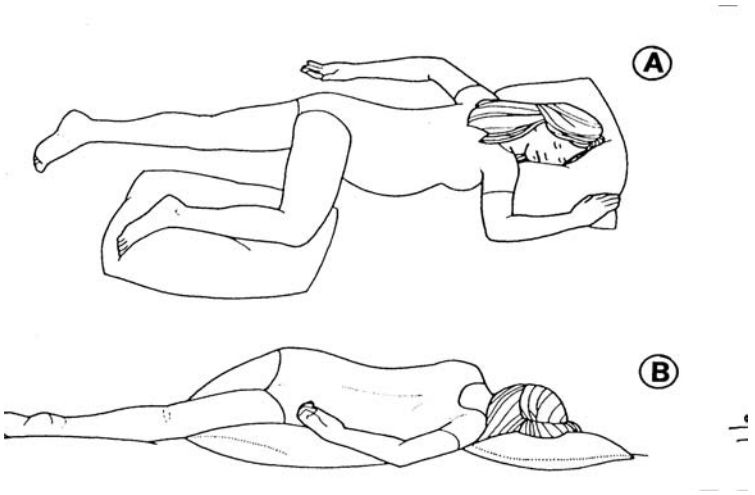


Figure 8-3. Positions for treatment of varicose veins.

(e) To relieve pain and swelling, take hot sitz baths or local application of astringent compresses (witch hazel pads).

c. **Edema (Ankle Edema, Nonpitting to Lower Extremities).**

(1) Edema is very common during pregnancy. It most often occurs during the second and third trimesters. Edema is caused by reduced blood circulation in the lower extremities as the gravid uterus puts pressure on the large vessels. Edema is most noticeable at the end of the day and it is normal in pregnancy as long as it is not accompanied by the following:

(a) Proteinuria (the presence of an excess of serum proteins in the urine).

(b) Edema of nondependent parts.

(c) Sudden increase in weight.

(d) Hypertension.

(2) Nursing intervention consists of advising the patient to:

(a) Maintain good posture.

(b) Avoid prolonged standing or sitting.

(c) Wear support stockings.

(d) Avoid constrictive clothing (garters, knee-high hose).

(e) Drink at least eight glasses of fluid for "natural" diuretic effect.

(f) Get adequate rest and exercise; include rest periods to elevate legs.

(3) Treatment of ankle edema.

(a) Elevate the feet as often as possible.

(b) Apply support stockings before getting up.

(c) Diuretics are contraindicated.

(4) If condition worsens to a generalized edema, the patient should notify her physician.

8-5. DISCOMFORTS RELATED TO THE RESPIRATORY SYSTEM

a. **Dyspnea**.

(1) Dyspnea is caused by the limited expansion of the diaphragm by the enlarging uterus. It may be an increased sensitivity to or compensation for slight acidosis ("breathing for two").

(2) Dyspnea may be very troublesome in the last weeks of pregnancy. The patient may have difficulty sleeping.

(3) Nursing interventions consist of advising the patient to:

(a) Sleep on additional pillows.

(b) Maintain good posture.

(c) Avoid overeating.

(d) Stop or decrease smoking.

(e) Limit activity before becoming dyspenic.

(f) Decrease anxiety by concentrating on slow, deep breaths.

(4) Dyspnea of sudden onset in patients who are known to have heart disease may be a sign of impending heart failure. The physician should be notified immediately.

b. **Nasal Stuffiness**. Nasal stuffiness is caused by increased vascularization due to the increase in hormone. It is not preventable; functioning of the nasal will return to normal after delivery.

8-6. DISCOMFORT RELATED TO THE REPRODUCTIVE SYSTEM

a. **Leukorrhea**.

(1) Leukorrhea is a white or yellowish mucous discharge from the cervical canal or the vagina. It is caused by the hormonal stimulation of the cervix, which becomes hypertrophic and hyperactive producing an abundant amount of mucous.

(2) Leukorrhea is not preventable and the patient should not douche.

(3) Leukorrhea may lead to pruritis (severe itching), burning on urination, foul odor from the discharge, or edema of the vulva.

NOTE: The physician should be notified immediately if any of the above (paragraph 8-6a(3)) symptoms appear. It may be an infection.

(4) Treatment/nursing intervention consists of:

(a) Reassuring the patient that this is normal. Tell the patient to use perineal pads and to change them frequently. Also, to cleanse the vulva at least once a day with soap and water and to dry thoroughly.

(b) Advising the patient to maintain good hygiene.

b. **Braxton Hicks' Contractions**. These are mild, intermittent, usually painless, uterine contractions. These contractions are in the preparation for the work of labor. Treatment/nursing interventions consist of advising the patient:

(1) That these are normal contractions.

(2) To get plenty of rest.

(3) To change position as often as possible.

(4) To practice breathing techniques when contractions are bothersome.

8-7. DISCOMFORTS RELATED TO THE URINARY SYSTEM

a. **Urinary Frequency and Urgency**.

(1) This is caused by the vascular engorgement and altered bladder function. It is caused by an increase in hormones and by the reduction of bladder capacity. This is due to the enlarging uterus and fetal presenting part.

NOTE: The presenting part is that part of the fetus which lies closest to the internal os of the cervix.

(2) Nursing interventions consist of advising the patient:

(a) That this is normal.

(b) To limit fluid intake before bedtime to ensure rest.

(c) To wear perineal pads.

(d) Notify the physician if pain or burning is noted.

b. **Stress Incontinence**. This occurs later in pregnancy. The patient may actually void on herself. Stress incontinence is caused by the enlarging uterus and pressure on the presenting part on the bladder. Nursing interventions consist of:

(1) Teaching the mother how to do the Kegel exercise. The Kegel exercise is the alternate tightening and relaxing of the muscles of the perineum.

(2) Encouraging the mother to wear perineal pads.

(3) Informing the patient to notify the physician so that rupture of the membranes can be ruled out.

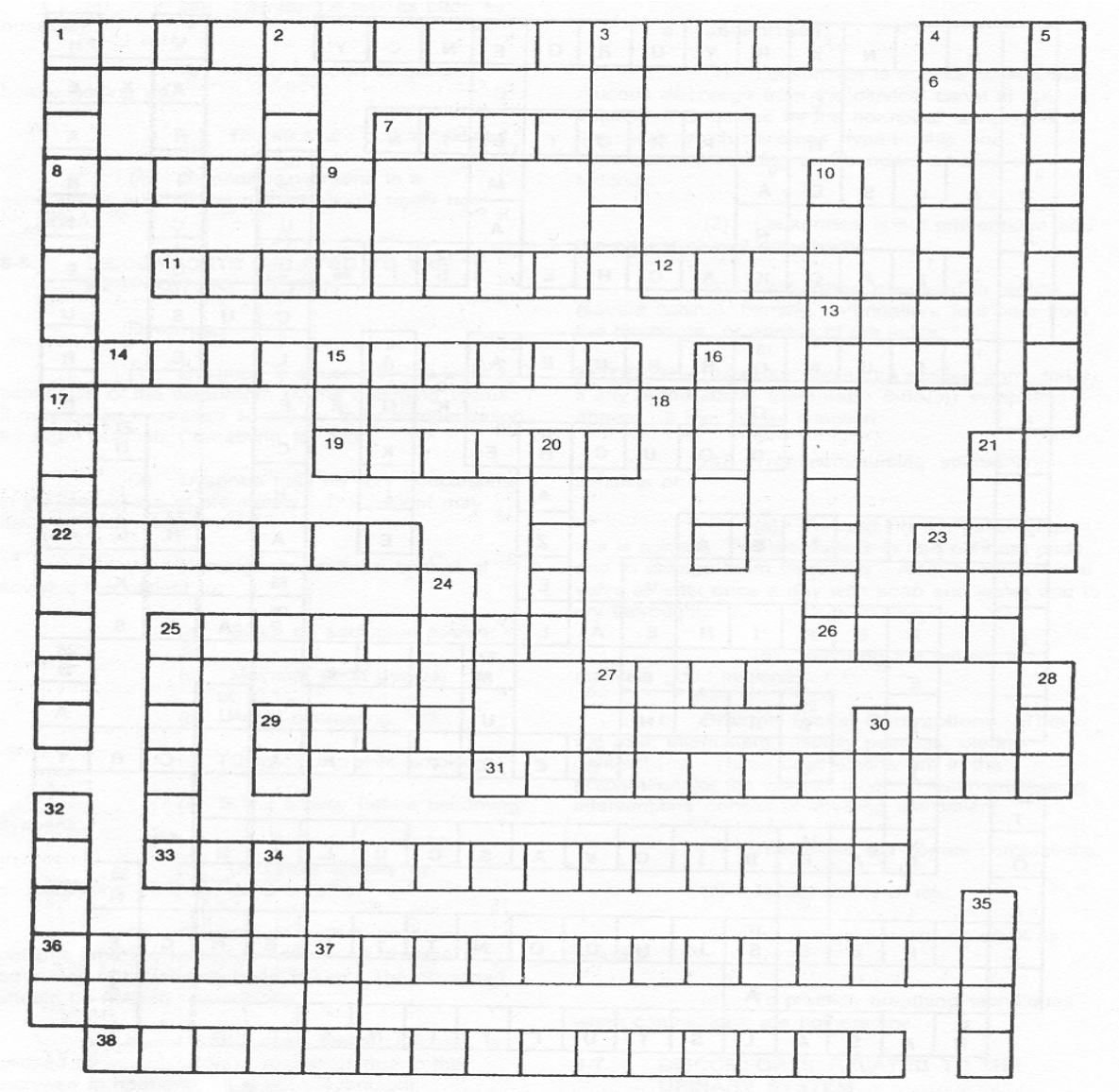
Continue with Exercises

EXERCISES, LESSON 8

INSTRUCTIONS: This exercise is in the form of a crossword puzzle. The following information pertains to minor discomforts of a pregnant patient. Answer the statement, complete the word, or fill in the blanks as presented. Place your answer in the correct blocks of the puzzle.

After you have filled in all of the blocks, turn to "Solutions to Crossword Puzzle" at the end of the lesson and check your answers.

CROSSWORD PUZZLE--MINOR DISCOMFORTS OF A PREGNANT PATIENT



ACROSS

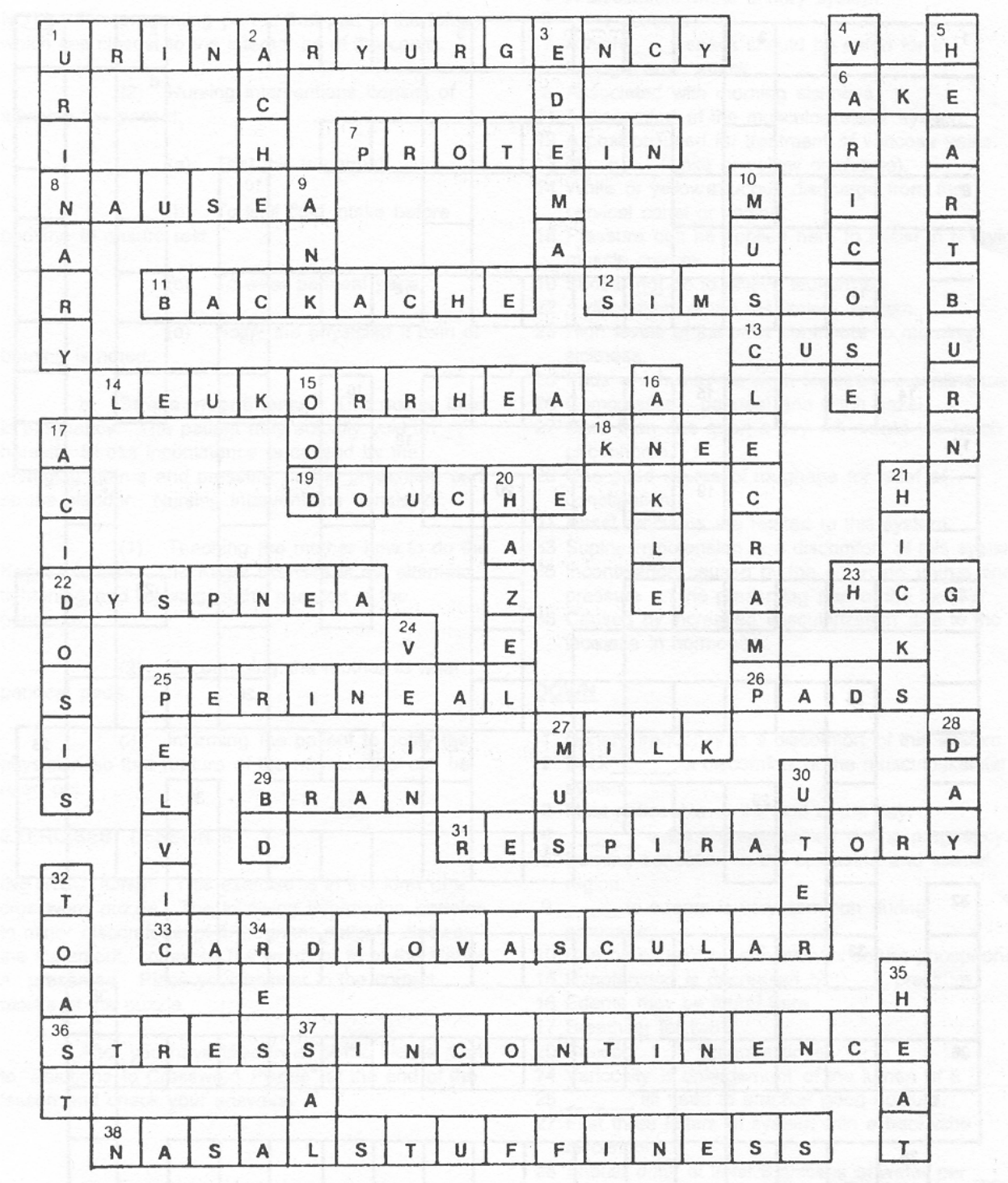
1 A discomfort of the urinary system.
6 _ _n_ l__ edema.
7 A high _____ snack should be eaten for a hypoglycemic attack.
8 Associated with morning sickness.
11 A discomfort of the musculoskeletal system.
12 A position used for treatment of varicose veins.
13 Mu_o_ _ (white or yellow discharge).
14 White or yellow mucous discharge from the cervical canal or vagina.
18 Pressure can be applied here to assist in relieving muscle cramps.
19 Should not do to relieve leukorrhea.
22 A discomfort of the respiratory system.
23 High levels of this may contribute to morning sickness.
25 Pads, which may be worn for, stress incontinence.
26 Compresses - perineal and witch hazel.
27 More than one quart a day will create too much phosphorus.
29 One good source of roughage for relief of constipation.
31 Nasal problems are related to this system.
33 Supine hypotension is a discomfort of this system.
36 Incontinence caused by the enlarging uterus and pressure on the presenting part of the bladder.
38 Caused by increased vascularization due to the increase in hormones.

DOWN

1 Urinary frequency is a discomfort of this system.
2 Back _____ a discomfort of the musculoskeletal system.
3 Most noticeable at the end of the day.
4 _____ veins are aggravated during pregnancy.
5 Burning sensation in the epigastric and sternal region.
9 _____le edema is very common during pregnancy.
10 Can be caused by elevation of serum phosphorus.
15 Hypotension is decreased bl_____ pressure.
16 Edema may be found here.
17 Breathing for two.
20 To Relieve pain and swelling, apply witch _____pads.
21 Braxton _____ contractions.
24 Varicosity is enlargement of the lumen of a _____.
25 _____ tilt used to practice good posture.
27 First three letters of system with a backache discomfort.
28 Should drink at least 6 glasses of water per _____ when constipated.
29 Vitamins to take for muscle cramps.
30 First four letters of uterus.
32 Eat dry before getting up.
34 Dyspnea, a ____piratory system discomfort.
35 Apply to area of muscle cramp.
37 Na_ _ _ stuffiness is not preventable.

Check Your Answers on Next Page

SOLUTIONS TO EXERCISE (CROSSWORD PUZZLE), LESSON 8


1 U R I N 2 A R Y U R G 3 E N C Y 4 V 5 H
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R 11 B A C K A C H E 12 S I M S O B
Y 13 C U S U
14 L E U K 15 O R R H E A 16 A L E R
17 A O 18 K N E E N
C 19 D O U C H E K C 21 H
I A L R I
22 D Y S P N E A Z E 23 H C G
O 24 V E M K
S 25 P E R I N E A L 26 P A D S
I E I 27 M I L K 28 D
S L 29 B R A N U 30 U A
V D 31 R E S P I R A T O R Y
32 T I E
O 33 C A 34 R D I O V A S C U L A R
A E 35 H
36 S T R E S 37 S I N C O N T I N E N C E
T A A
38 N A S A L S T U F F I N E S S T

End of Lesson 8

LESSON ASSIGNMENT

LESSON 9 Patient Education During Pregnancy.

TEXT ASSIGNMENT Paragraphs 9-1 through 9-8.

LESSON OBJECTIVES After completing this lesson, you should be able to:

9-1. Identify types of education used to prepare prenatal patients for parenthood.

9-2. Select statements concerning layette planning.

9-3. Identify principles of proper nutrition during pregnancy.

9-4. Identify statements concerning cravings during pregnancy.

9-5. Identify statements concerning the obese, pregnant patient.

9-6. Select the definition of teratogen.

9-7. Identify drugs, viruses, parasites, and conditions that are considered teratogenic.

9-8. Identify statements concerning labor and delivery that refer to the preparation of labor and delivery.

9-9. Identify definitions as they refer to approaching labor.

SUGGESTION After studying the assignment, complete the exercises at the end of this lesson. These exercises will help you to achieve the lesson objectives.

LESSON 9

PATIENT EDUCATION DURING PREGNANCY

9-1. GENERAL

The practical nurse can play a significant role in the process of providing patient education during pregnancy. The prenatal patient, especially the first-time mother, may have many questions and concerns about this period in her life. Much of the information she may have is probably inaccurate or incomplete. You, as a practical nurse, must provide accurate and complete information about self-care concerns, diet needs, what to expect as labor and delivery approaches, and the dangers within the environment, which may affect the health of the unborn infant.

9-2. TYPES OF EDUCATION FOR PRENATAL PATIENTS PREPARING FOR PARENTHOOD

Individual teaching and counseling, information groups, discussion or counseling groups, and prepared childbirth groups are the types of education that are presented in this lesson.

a. **Individual Teaching and Counseling**.

(1) One-to-one teaching. This type of teaching is used in all nursing settings. It teaches on an individual basis as needed. One-to-one teaching is beneficial in teaching patients to understand and to adapt to health problems with a pregnancy.

(2) Counseling. This entails an interchange of opinions or giving of advice. It is more personal and feeling-oriented. When counseling is used in combination with facts, it enhances learning. It takes into account the patient's feelings.

b. **Information Groups**.

(1) These are planned groups to serve everyone in the community. It provides information on the physiology of childbearing, general hygiene, nutrition during pregnancy and lactation, preparations for the baby, and care of the mother and baby after delivery.

(2) Methods of presentation include lecture, films and slides, questions and discussion, and tours of appropriate areas (labor and delivery, newborn, and postpartum).

(3) These groups are organized by the American National Red Cross, the YWCA, Public Health Departments, Adult Education Programs at community schools/colleges, hospitals, and groups of physicians.

c. **Discussion or Counseling Groups**.

(1) There is no structured curriculum for this type of teaching. Discussion is developed from the contributions of group members. The group leader must be knowledgeable and able to discuss all topics concerning obstetric and newborn care.

(2) This type of instruction has the advantage of not limiting the discussion to certain topics as done in class groups. It allows for more participation and involvement by the parents. Remember, it takes a highly qualified individual who is good at listening but who is also capable to keep the discussion going.

d. **Prepared Childbirth Groups**.

(1) This is a form of informational instruction but includes active participation by the group to prevent the fear-tension-pain mechanism of labor. It is designed to eliminate fear during pregnancy.

(2) Facts taught concern:

(a) Anatomy and physiology of childbearing.

(b) Appropriate care of the pregnant woman.

(c) Sensations likely to accompany labor.

(d) Methods to work cooperatively with the sensations.

(e) Exercises to strengthen muscles in labor.

(f) Breathing techniques to develop relaxation during labor.

(g) Needs of the baby after birth.

(h) Information about growth and development.

9-3. LAYETTE PLANNING

a. **Layette**. A layette is considered as the clothing and supplies needed to care for the infant following birth. Parents in classes are encouraged to prepare for the infant's arrival before birth. Baby showers are usually given by the family and friends to help provide some of the necessary items. Some clothing and care items are taken to the hospital to bring the infant home. It is important to remind new parents that infants grow quickly. Encourage them to not buy a lot of newborn items; infants outgrow clothes very quickly, and in some cases, the clothes are never worn.

b. **Layette Contents**. Table 9-1 shows items that are commonly found in a layette.

LAYETTE

CLOTHING	SUPPLIES
• Diapers (disposable or cloth)	• Crib, bassinette, or cradle
• Nightgowns, clothing sets	• Diaper pail, maybe diaper plan
• Sweaters, cap, booties	• Bottles, nipples, formula
	• Car seat, blankets, crib sheets
	• Diaper pins, rubber sheets
	• Towels, washcloths, bath lotion

Table 9-1. Typical items in a layette.

9-4. PRINCIPLES OF PROPER NUTRITION

a. **Good Nutrition**. Good nutrition during pregnancy is essential for:

(1) The well-being of the mother and the developing fetus.

(2) Development of effective uterine musculature.

(3) Development of breast tissue.

(4) Development of an adequate functioning placenta. Poorly nourished mothers have placentas with fewer and smaller cells. Also, poorly developed placentas have a **reduced** ability to synthesize substances needed by the fetus, to facilitate the flow of needed nutrients, and to inhibit passage of potentially harmful substances.

(5) Development of infant's weight, length, bones, and brain. A nutritionally deprived fetus may have decreased development of brain cells. If optimum nutrition is provided after birth, the effects on the brain may be reversible.

(6) Continued development of the infant after birth.

b. **Chronic Malnutrition**. This has been shown to be related to reproduction problems (this includes difficulties during pregnancy, labor, and delivery), increased perinatal mortality, low birth weight, and other problems with the newborn.

c. **Nutritional Risk Factors in Pregnancy that Require Observation**.

(1) Risk factors at the onset of pregnancy.

(a) Adolescence. Many adolescents are nutritionally at risk due to a variety of complex and interrelated emotions and social and economic factors that may adversely affect dietary intake. Their nutritional needs are greater and pose much concern from nurses and physicians.

(b) Frequent pregnancies. These pregnancies may have depleted nutrient stores. This situation can compromise maternal and fetal health and well-being.

(c) Poor reproductive history. Previous poor weight gain, pregnancy-induced hypertension (PIH), previous stillbirth or small for gestational age (SGA) baby, premature delivery, and prenatal infection are all common in women who are or have been poorly nourished in the past. These women may need more than the usual nutrition guidance.

(d) Economic deprivation. This refers to the pregnant patient who is not able to afford proper food. There are several programs that help with the purchase of food or that offer supplements.

(e) Bizarre food patterns. This includes faddish diets. A woman may enter pregnancy either having or continuing to be on a faddish or otherwise nutritionally inadequate diet.

(f) Vegetarian diets. This diet may not contain any or enough protein or vitamins for a developing fetus. Intense nutritional counseling will be required to work out a diet pattern during the prenatal period.

(g) Smoking, drug addiction, and alcoholism. Physiologic problems may have been present. Pregnant patients who indulge in this category may have major physiologic problems. There is the possibility that the patient may not consume sufficient quantities of nutritious foods and, in addition, can cause major problems to the fetus.

(h) Chronic systemic disease. There may have been medical problems, which may have interfered with ingestion, absorption, or utilization of nutrients. Drugs used to treat these conditions may also affect nutrition by similar interference. Counseling should include general nutrition guidelines for prenatal care and diet therapy.

(i) Pre-pregnant weight. This may be at risk if the patient is fifteen percent or more below or twenty percent or more above the standard weight for health.

(2) Risk factors identified during pregnancy.

(a) Anemia of pregnancy. Many pregnant patients have a lack of iron stores large enough to meet the needs of pregnancy.

(b) Pregnancy-induced hypertension (PIH). This may be seen in more patients with poor diets. However, there is no definite documentation of PIH's relationship to the diet.

(c) Inadequate weight gain. This may be an indication of maternal and fetal malnutrition (intrauterine growth retardation (IUGR)). It is important to document the pattern of weight gain in pregnancy as well as the total amount of weight gained.

(d) Excessive weight gain. This may be due to fluid retention. However, the pregnant woman should be carefully assessed for PIH.

d. **Caloric Requirements of Pregnancy**.

(1) Daily caloric requirements for a pregnant woman are about 300 more than their normal requirements of 2300 to 2700 calories. The exact requirements are dependent on the patient's age, multiple birth, and the patient's activity. Calories should be selected for **quality** rather than **quantity**. "Empty calories" do not count.

(2) Pregnancy is not the time to correct weight problems. Maintenance of a minimum of 1500 calories a day is essential for fetal development throughout the pregnancy. Patients who gain extra weight the first seven months then decide to cut back so as not to go overweight deprive the fetus of:

(a) Nutrients necessary when the fetal brain cells are growing the fastest.

(b) Nutrients necessary when the protective layer of fat is being developed.

(3) Foods rich in protein, iron, and essential nutrients are recommended to be eaten on a daily basis. During the first two trimesters of pregnancy, iron is transferred to the fetus in moderate amounts, but during the last trimester when the fetus builds its reserve, the amount transferred is accelerated ten times.

(4) Recommended weight gain for a normal pregnancy is 24 to 30 pounds. See figure 9-1 for the distribution of weight gained after 40 weeks of pregnancy.

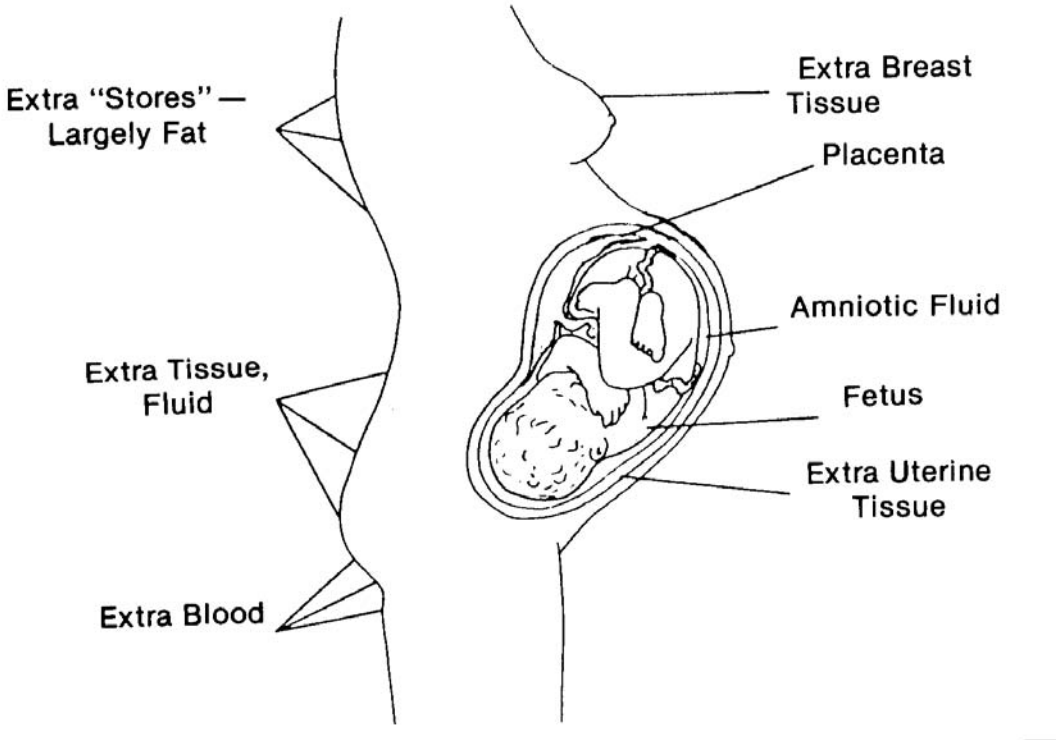


Figure 9-1. Distribution of normal weight gain.

e. **Menu planning**. A diet consisting of a variety of foods can supply needed nutrients. The increased quantities of essential nutrients needed during the pregnancy may be met by skillful planning around the basic four food groups. The recommended daily intake from the basic four food groups are as follows:

(1) Milk group-32 oz or 1000 ml per day.

(2) Meat group-4 servings per day to include:

(a) Beef, veal, pork, poultry, or fish.

(b) Eggs each day.

(c) Liver once a week.

(3) Vegetable and fruit group.

(a) 2 servings daily of dark green or yellow vegetables.

(b) 2 servings daily of fruit.

(4) Bread and cereal group-4 servings per day.

9-5. CRAVINGS DURING PREGNANCY

a. **Craving**. This is a strong desire for a certain type of food, usually carbohydrates.

b. **Pica**. This is an intense craving for and ingestion of nonnutritive substances such as clay, laundry starch, raw flour, and rice. This type of craving is characteristic of but is not limited to lower socioeconomic groups, ethnic groups, and regional areas, which prefer certain substances. Even though the cause is unknown, it interferes with good nutrition. Pica appears to be related to iron deficiency anemia as either a cause or an effect.

c. **Treatment or Counseling**.

(1) Anything that depresses good nutritional intake should be evaluated. This type of depression may be caused by nausea or vomiting, food fads or lack of finances, smoking or alcoholism, or personal or social problems. If a problem is identified, it should be reported to the charge nurse or physician for appropriate referral to the correct people who can relieve or eliminate the problem.

(2) Total dietary intake on a daily basis may need to be assessed.

(3) Dietary needs of pregnancy should be reinforced at every visit to the doctor.

9-6. OBESITY

a. Obesity is common and frequently a serious problem among Americans. The patient is considered overweight if she is 10 percent over her desirable weight for their height and age group. If the patient is 20 percent over her desirable weight at the beginning of the pregnancy, she is considered at risk.

b. These patients require close observation and additional education. The most frequently prescribed diet is 1500 to 1800 calories per day. The patient must be advised that this in not the time to diet to lose weight. Encouragement is greatly needed during the pregnancy.

9-7. TERATOGENS

a. A teratogen is an agent or factor that causes the production of physical defects in the developing fetus.

b. Many drugs are known to have teratogenic effects on the fetus if taken during pregnancy. Drugs are the most widely recognized cause of structural defects in the developing fetus. Patients need to be cautioned about taking any medication without a physician's approval. Over-the-counter medicines such as nose drops, cold remedies, and sleep medications may cause problems.

(1) Examples of known effects:

(a) Physical abnormalities - no arms or legs.

(b) Hemorrhage or jaundice.

(c) Neurologic symptoms.

(d) Abnormal dental pigmentation.

(e) Addiction.

(f) Vaginal malignancy or altered sperm causing infertility.

(2) The effects of many drugs may not be known until later years during the growth and development of the child.

c. Teratogenic drug examples.

(1) Thalidomide-used in England in the 1950's and 1960's as a sedative.

(2) Phenytoin (Dilantin)®-used for seizures.

(3) Methotrexate®-used to treat neoplastic diseases.

(4) Diethylstilbestrol®-used for vasomotor symptoms during menopause.

(5) Accutane®--used to treat cystic acne.

d. Teratogenic viruses and parasites.

(1) Herpes simplex.

(2) Rubella (German measles).

(3) Toxoplasmosis. This is transmitted by cat feces and raw meat.

(4) Influenza or viral infections in the early weeks of pregnancy.

e. Other teratogenic conditions.

(1) Hyperthermia.

(2) Maternal disease (diabetes).

(3) Maternal malnutrition.

(4) X-rays should be avoided. Radiation from the x-rays can cause deformity of the fetuses if exposed in the first trimester.

(5) Environmental pollutants.

(6) Lead.

(7) Increase in maternal age.

(8) Tobacco and alcohol.

f. Patients need to be reminded of the potential dangers of the things they may do or take. The worst damage to the fetus is done in the early weeks of the pregnancy before she even knows she is pregnant.

9-8. PREPARATION FOR LABOR AND DELIVERY

a. **Relaxation and Psychological Control of Pain**. Several methods of relaxation and psychological control of pain during labor are listed below:

(1) Lamaze method (Psychoprophylactic method-PPM). This method is the most widely taught. It deals with combating the fears associated with pregnancy by teaching relaxation and breathing techniques.

(a) The patient is taught to replace responses of restlessness and loss of control with more useful activity.

(b) The patient is taught to respond to pain with respiratory activity and relaxation of uninvolved muscles.

(c) The patient is taught controlled breathing and mind-focusing techniques.

(d) The partner is taught to help the patient stay in control.

(2) Bradley method (husband-coached childbirth). This is similar to the Lamaze method. Emphasis is placed on slow, deep breathing along with complete relaxation. Women using this practice often appear to be asleep during labor. However, they are not asleep, but are simply in a state of deep mental relaxation.

(3) Hypnosis. This is an induced state of extreme suggestibility in which the patient is insensible to outside impressions except the suggestion of her attendant.

b. **Signs of Approaching Labor**. These signs of approaching labor are taught to all patients. When the patient notices them, she is aware that labor will be forthcoming. The signs are:

(1) Lightening. This is the descent of the fetus into the brim of the pelvis (dropping). Lightening occurs in the last 10 to 14 days of pregnancy in a primigravida. It may not occur until actual onset of labor in multigravidas. The patient identifies it as being able to breathe easier.

(2) False labor (Braxton-Hicks Contractions). This is intermittent uterine contractions occurring at irregular intervals, which serve to tone the uterus.

(3) "Show." This is when the blood-tinged mucoid vaginal discharge becomes more pronounced and red as cervical dilatation increases during labor.

(4) "Burst of energy." This is an increase in energy level. It occurs approximately 24 hours before onset of labor. The patient should be advised to relax during this time since labor will be starting soon.

(5) Rupture of membranes. This occasionally may be the first sign. Due to the risk of the prolapse cord, the patient needs to be aware that she should come to the hospital immediately even if she is not having contractions. If the membranes rupture prematurely, it then becomes a complication.

(6) Frequent urination. This, again, becomes a problem in the last stages of pregnancy. Pressure on the bladder is due to the enlarging uterus and the head settling back into the pelvis.

Continue with Exercises

EXERCISES, LESSON 9

INSTRUCTIONS: Answer the following exercises by marking the lettered response that best answers the exercise, by completing the incomplete statement, or by writing the answer in the space(s) provided.

After you have completed all of these exercises, turn to "Solutions to Exercises" at the end of the lesson and check your answers. For each exercise answered incorrectly, reread the material referenced with the solution.

1. List the four types of education for prenatal patients who are preparing for parenthood.

   _____.

   _____.

   _____.

   _____.

2. The clothing and supplies needed to care for the infant following birth is known as:

   _____

3. Good nutrition during pregnancy is essential for the well-being of the mother and the developing fetus, and for the development of:

   _____.

   _____.

   _____.

   _____.

   _____.

4. List the nutritional risk factors that requires observation at the onset of pregnancy.

   _____.

   _____.

   _____.

   _____.

   _____.

   _____.

   _____.

   _____.

   _____.

5. Nutritional risk factors that are identified during pregnancy includes anemia of pregnancy, pregnancy-induced hypertension,

   _____ and _____.

6. Craving is an intense desire for and ingestion of nonnutritive substances.

   a. True.

   b. False.

7. An obese pregnant patient requires close observation and additional education.

   a. True.

   b. False.

8. The recommended daily intake of liver is once a week.

    a. True.

    b. False.

9. The period during pregnancy is a good time for the patient to diet.

    a. True.

    b. False.

10. Counseling entails an interchange of opinions and giving advice.

    a. True.

    b. False.

11. A minimum of 1500 calories a day is good for fetal development during pregnancy.

    a. True.

    b. False.

12. Pica is having a strong desire for a certain type of food, usually carbohydrates.

    a. True.

    b. False.

13. Neurologic symptoms and addiction are known effects of teratogenic drugs.

    a. True.

    b. False.

14. List the signs of approaching labor.

_____.

_____.

_____.

_____.

_____.

15. What methods are used for relaxation and psychological control of pain?

_____.

_____.

_____.

16. _____ is an agent or factor that causes the production of physical defects in the developing fetus.

17. Foods, which are rich in _____, _____, and _____ should be eaten on a daily basis.

Check Your Answers on Next Page

SOLUTIONS TO EXERCISES, LESSON 9

1. individual teaching and counseling.
   information groups.
   discussion or counseling groups.
   prepared childbirth groups (para 9-2).

2. layette (para 9-3a).

3. effective uterine musculature.
   breast tissue.
   adequate functioning placenta.
   infant's weight, length, bones, and brain.
   infant after birth (para 9-4a).

4. an adolescent.
   frequent pregnancies.
   poor reproductive history.
   economic deprivation.
   bizarre food patterns.
   vegetarian diets.
   smoking, drug addiction, alcoholism.
   chronic systemic disease.
   pre-pregnant weight. (para 9-4c(1))

5. inadequate weight gain.
   excessive weight gain. (para 9-4c(2))

6. b (para 9-5a).

7. a (para 9-6b).

8. a (para 9-4e(2)(c)).

9. b (para 9-4d(2)).

10. a (para 9-2a(2)).

11. a (para 9-4d(2)).

12. b (para 9-5b).

13. a (para 9-7b(1)).

14. lightening.
    false labor (Braxton-Hicks Contractions).
    "Show".
    "Burst of energy".
    rupture of membranes.
    frequent urination (para 9-8b).

15. Lamaze method.
    Bradley method.
    Hypnosis (para 9-8a).

16. teratogen (para 9-7a).

17. protein.
    Iron.
    essential nutrients (para 9-4d(3)).

End of Lesson 9

LESSON ASSIGNMENT

LESSON 10 Fetal Positions and Adaptations.

TEXT ASSIGNMENT Paragraphs 10-1 through 10-4.

LESSON OBJECTIVES After completing this lesson, you should be able to:

10-1. Identify key terms and definitions that are related to fetal positions.

10-2. Identify the two types of "lie" positions of an infant.

10-3. Identify the three types of fetal presentations.

10-4. Identify the four types of attitudes seen during the birth process.

10-5. Identify descriptive statements referring to the station of the fetus during labor.

10-6. Identify descriptive statements, which refer to the specific points and positions of the fetus during labor and delivery.

10-7. Identify the different types of breech presentations.

10-8. Identify descriptive statements referring to the mechanism of labor.

SUGGESTION After studying the assignment, complete the exercises at the end of this lesson. These exercises will help you to achieve the lesson objectives.

LESSON 10

FETAL POSITIONS AND ADAPTATIONS

10-1. GENERAL

The nursing care you may administer to the laboring patient is included in this lesson by presenting key factors in the relationship of the fetus to the obstetric passageway. You may not actually determine this information, however, it is vital that you have a basic understanding of what the nurse or physician identifies. This information will influence the length of labor, preparations for the delivery room, and the type of complications that may occur.

10-2. KEY TERMS RELATED TO FETAL POSITIONS

a. **"Lie" of an Infant**. Lie refers to the position of the spinal column of the fetus in relation to the spinal column of the mother. There are two types of lie, longitudinal and transverse. Longitudinal indicates that the baby is lying lengthwise in the uterus, with its head or buttocks down. Transverse indicates that the baby is lying crosswise in the uterus.

b. **Presentation/Presenting Part**. Presentation refers to that part of the fetus that is coming through (or attempting to come through) the pelvis first.

(1) Types of presentations (see figure 10-1). The vertex or cephalic (head), breech, and shoulder are the three types of presentations. In vertex or cephalic, the head comes down first. In breech, the feet or buttocks comes down first, and last--in shoulder, the arm or shoulder comes down first. This is usually referred to as a transverse lie.

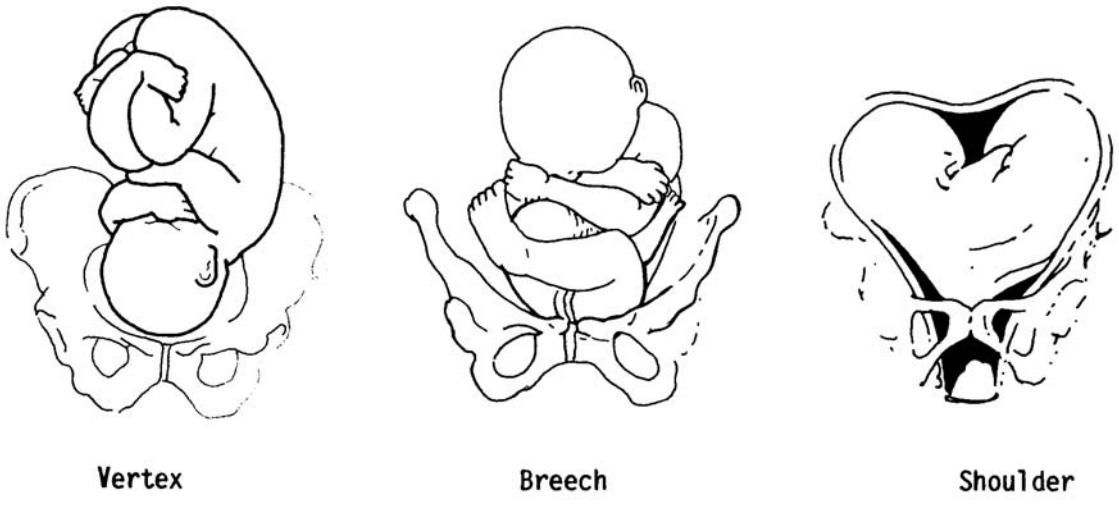


Figure 10-1. Typical types of presentations.

(2) Percentages of presentations.

(a) Head first is the most common-96 percent.

(b) Breech is the next most common-3.5 percent.

(c) Shoulder or arm is the least common-5 percent.

(3) Specific presentation may be evaluated by several ways.

(a) Abdominal palpation-this is not always accurate.

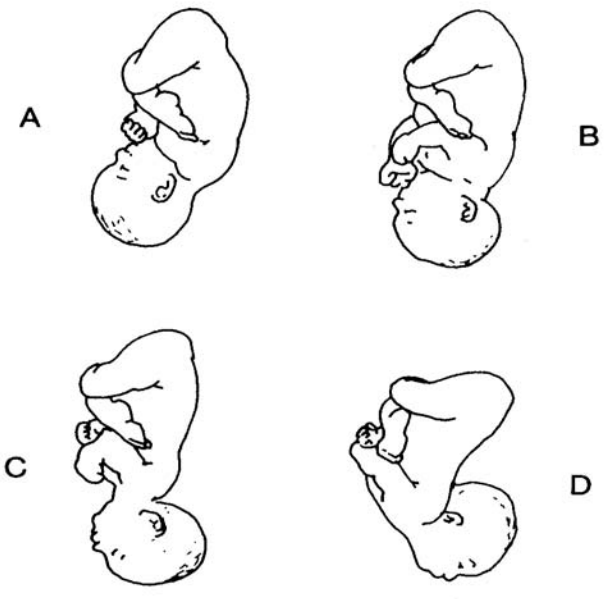
(b) Vaginal exam--this may give a good indication but not infallible.

(c) Ultrasound--this confirms assumptions made by previous methods.

(d) X-ray--this confirms the presentation, but is used only as a last resort due to possible harm to the fetus as a result of exposure to radiation.

c. **Attitude**. This is the degree of flexion of the fetus body parts (body, head, and extremities) to each other. **Flexion** is resistance to the descent of the fetus down the birth canal, which causes the head to flex or bend so that the chin approaches the chest.

(1) Types of attitude (see figure 10-2).



A--Complete flexion. B-- Moderate flexion. C--Poor flexion. D--Hyperextension

Figure 10-2. Types of attitudes.

(a) Complete flexion. This is normal attitude in cephalic presentation. With cephalic, there is complete flexion at the head when the fetus "chin is on his chest." This allows the smallest cephalic diameter to enter the pelvis, which gives the fewest mechanical problems with descent and delivery.

(b) Moderate flexion or military attitude. In cephalic presentation, the fetus head is only partially flexed or not flexed. It gives the appearance of a military person at attention. A larger diameter of the head would be coming through the passageway.

(c) Poor flexion or marked extension. In reference to the fetus head, it is extended or bent backwards. This would be called a brow presentation. It is difficult to deliver because the widest diameter of the head enters the pelvis first. This type of cephalic presentation may require a C/Section if the attitude cannot be changed.

(d) Hyperextended. In reference to the cephalic position, the fetus head is extended all the way back. This allows a face or chin to present first in the pelvis. If there is adequate room in the pelvis, the fetus may be delivered vaginally.

(2) Areas to look at for flexion.

(a) Head-iscussed in previous paragraph, 10-2c(1).

(b) Thighs-flexed on the abdomen.

(c) Knees-flexed at the knee joints.

(d) Arches of the feet-rested on the anterior surface of the legs.

(e) Arms-crossed over the thorax.

(3) Attitude of general flexion. This is when all of the above areas are flexed appropriately as described.

d. **Station**. This refers to the depth that the presenting part has descended into the pelvis in relation to the ischial spines of the mother's pelvis. Measurement of the station is as follows:

(1) The degree of advancement of the presenting part through the pelvis is measured in centimeters.

(2) The ischial spines is the dividing line between plus and minus stations.

(3) Above the ischial spines is referred to as -1 to -5, the numbers going higher as the presenting part gets higher in the pelvis (see figure10-3).

(4) The ischial spines is zero (0) station.

(5) Below the ischial spines is referred to +1 to +5, indicating the lower the presenting part advances.

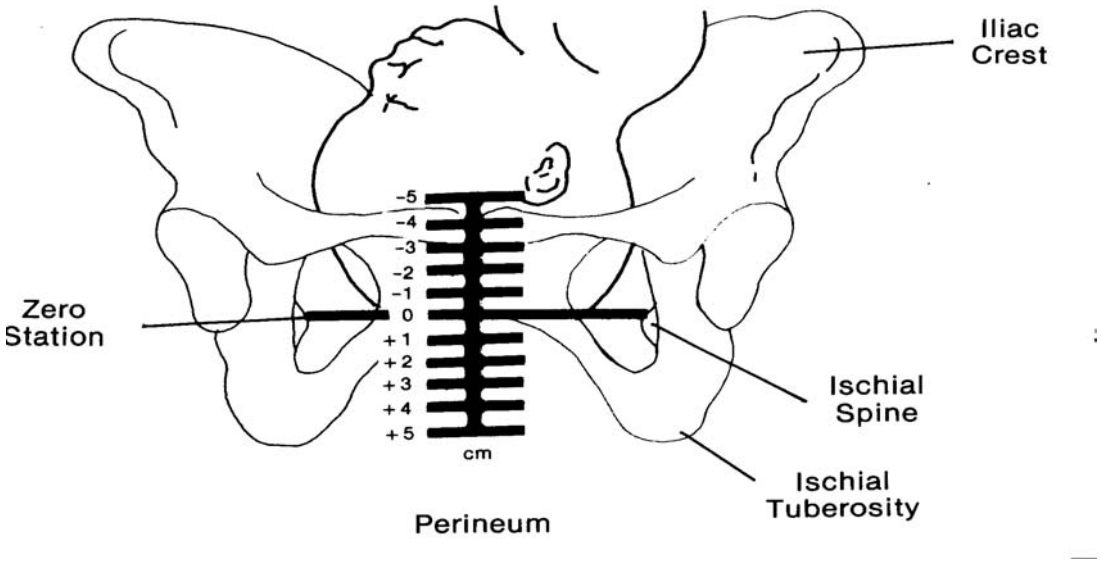


Figure 10-3. Measurement of station.

e. **Engagement**. This refers to the entrance of the presenting part of the fetus into the true pelvis or the largest diameter of the presenting part into the true pelvis. In relation to the head, the fetus is said to be engaged when it reaches the midpelvis or at a zero (0) station. Once the fetus is engaged, it (fetus) does not go back up. Prior to engagement occurring, the fetus is said to be "floating" or ballottable.

f. **Position**. This is the relationship between a predetermined point of reference or direction on the presenting part of the fetus to the pelvis of the mother.

(1) The maternal pelvis is divided into quadrants.

(a) Right and left side, viewed as the mother would.

(b) Anterior and posterior. This is a line cutting the pelvis in the middle from side to side. The top half is anterior and the bottom half is posterior.

(c) The quadrants never change, but sometimes it is confusing because the student or physician's viewpoint changes.

NOTE: Remember that when you are describing the quadrants, view them as the mother would.

(2) Specific points on the fetus.

(a) Cephalic or head presentation.

1 Occiput (**O**). This refers to the **Y** sutures on the top of the head.

2 Brow or fronto (**F**). This refers to the diamond sutures or anterior fontanel on the head.

3 Face or chin presentation (**M**). This refers to the mentum or chin.

(b) Breech or butt presentation.

1 Sacrum or coccyx (**S**). This is the point of reference.

2 Breech birth is associated with a higher perinatal mortality.

(c) Shoulder presentation.

1 This would be seen with a transverse lie.

2. Scapula (**Sc**) or its upper tip, the acromion (**A**) would be used for the point of reference.

(3) Coding of positions.

(a) Coding simplifies explaining the various positions.

1 The first letter of the code tells which side of the pelvis the fetus reference point is on (**R** for right, **L** for left).

2 The second letter tells what reference point on the fetus is being used (Occiput-**O**, Fronto-**F**, Mentum-**M**, Breech-**S**, Shoulder-**Sc** or **A**).

3 The last letter tells which half of the pelvis the reference point is in (anterior-**A**, posterior-**P**, transverse or in the middle-**T**).

(b) Each presenting part has the possibility of six positions. They are normally recognized for each position--using "occiput" as the reference point.

1 Left occiput anterior (**LOA**).

2 Left occiput posterior (**LOP**).

3 Left occiput transverse (**LOT**).

4 Right occiput anterior (**ROA**).

5. Right occiput posterior (**ROP**).

6 Right occiput transverse (**ROT**).

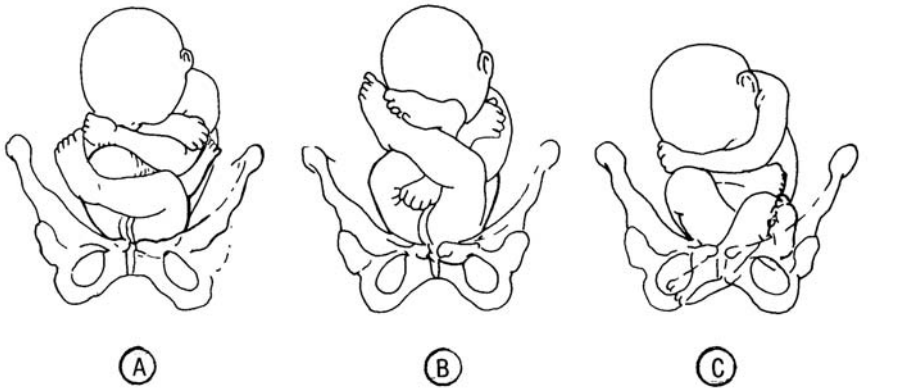
(c) A transverse position does not use a first letter and is not the same as a transverse lie or presentation.

1 Occiput at sacrum (**O.S.**) or occiput at posterior (**O.P.**).

2 Occiput at pubis (**O.P.**) or occiput at anterior (**O.A.**).

(4) Types of breech presentations (see figure10-4).

(a) Complete or full breech. This involves flexion of the fetus legs. It looks like the fetus is sitting in a tailor fashion. The buttocks and feet appear at the vaginal opening almost simultaneously.



A--Complete. B--Frank. C--Incomplete.

Figure 10-4. Breech positions.

(b) Frank and single breech. The fetus thighs are flexed on his abdomen. His legs are against his trunk and feet are in his face (foot-in-mouth posture). This is the most common and easiest breech presentation to deliver.

(c) Incomplete breech. The fetus feet or knees will appear first. His feet are labeled single or double footing, depending on whether 1 or 2 feet appear first.

(5) Observations about positions (see figure 10-5).

(a) **LOA** and **ROA** positions are the most common and permit relatively easy delivery.

(b) **LOP** and **ROP** positions usually indicate labor may be longer and harder, and the mother will experience severe backache.

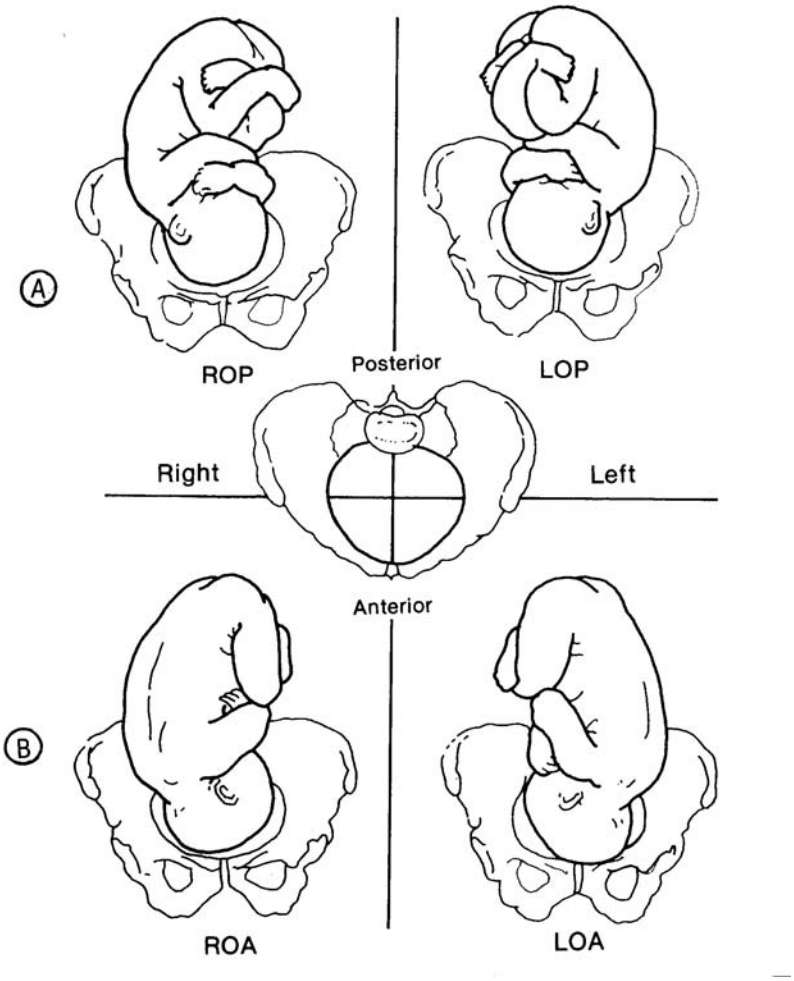


Figure 10-5. Examples of fetal vertex presentations in relation to quadrant of maternal pelvis.

(c) Knowing positions will help you to identify where to look for FHT's.

1 Breech. This will be upper **R** or **L** quad, above the umbilicus.

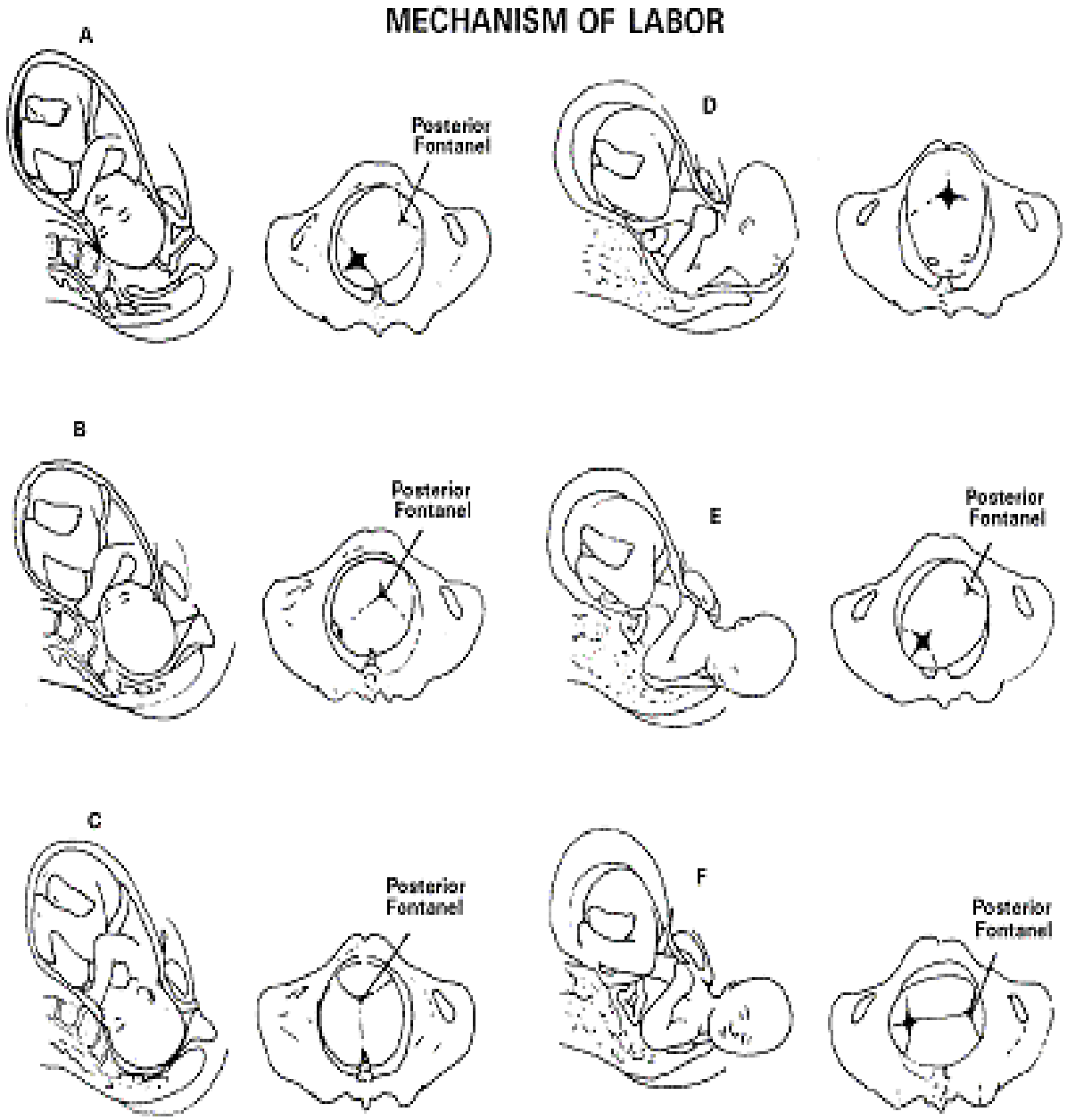
2 Vertex. This will be lower **R** or **L** quad, below the umbilicus.

(d) An occiput in the posterior quadrant means that you will feel lumpy fetal parts, arms and legs (see figure 10-5 A). If delivered in that position, the infant will come out looking up.

(e) An occiput in the anterior quadrant means that you will feel a more smooth back (see figure 10-5 B). If delivered in that position, the infant will come out looking down at the floor.

10-3. FETAL ADAPTATIONS (OR THE MECHANISM OF LABOR)

a. **Cardinal Movements**. This refers to the movements made by the fetus during the first and second stage of labor. As the force of the uterine contractions stimulates effacement and dilatation of the cervix, the fetus moves toward the cervix. When the presenting part reaches the pelvic bones, it must make adjustments to pass through the pelvis and down the birth canal (see figure 10-6).



A--Descent. B--Flexion. C--Internal rotation to OA.
D--Extension. E--Restitution. F--External rotation.

Figure 10-6. The mechanism of labor in the left occiput anterior (LOA) presentation.

b. **Fetus in the Vertex Position**. The fetus in the vertex position makes seven adaptations or cardinal movements. Refer to figure 10-6.

(1) Descent. The fetus head is pushed deep into the pelvis in a sideways position, the face is to the left and the occiput is to the right.

(a) In a primigravida, this may occur two weeks before delivery. This is referred to as "lightening." Lay people might call this "dropping."

(b) In a multipara, this may not occur until dilatation of the cervix.

(2) Flexion. As the fetus head descends, the chin is flexed to come into contact with the infant's sternum. The occiput position allows the occipital bone in the back of the head to lead the way (smallest diameter of the head).

(3) Engagement. This is when the presenting part is at the level of the ischial spines or at a zero (0) station. Before this time, it is referred as "floating."

(4) Internal rotation.

(a) The amount of internal rotation depends on the position of the fetus and the way the head rotates to accommodate itself to the changing diameters of the pelvis.

(b) If the fetus starts to descend in **LOA** or **LOT**, rotation is only a short distance-45 to 90 degrees.

(c) If the head is in a posterior position, it may mean a turn of 180 degrees.

(d) Occasionally, the fetus may not turn to the anterior position and is born O.P. (occiput posterior).

(5) Extension. As the previously flexed head slips out from under the pubic bone, the fetus is forced to extend his head so that the head is born pushing upward out of the vaginal canal. The natural curve of the lower pelvis and the baby's head being pushed outward forces distention of the perineum and vagina. As it moves through the vaginal canal, the chin lifts up (extends) and the head is delivered. During this maneuver, the fetal spine is no longer flexed, but extends to accommodate the body to the contour of the birth canal.

(6) External rotation restitution.

(a) Once the fetus head is out, it will turn to line up with its back, revealing its position just before internal rotation of the head. This is called restitution.

(b) This aids in internal rotation of the shoulders to an anteroposterior diameter of the pelvic outlet or shoulder rotation.

(7) Expulsion.

(a) The top of the anterior shoulder is seen next just under the pubis.

(b) Gentle downward pressure by the physician delivers the anterior shoulder.

(c) The head is gently raised to deliver the posterior shoulder.

(d) The rest of the body follows the head, which then completes expulsion.

(e) The fetus remains completely passive as it moves through the birth canal.

c. **Movement**. The first four movements (descent, flexion, engagement, and internal rotation) do not have to occur in any specific order.

10-4. CLOSING

A general understanding of how the fetus may present itself during labor will help you to understand why some labors are so long and difficult. In addition, this will help you in understanding what the fetus must go through during the process of presenting himself out of the patient's womb.

Continue with Exercises

EXERCISES, LESSON 10

INSTRUCTIONS: Answer the following exercises by marking the lettered response that best answers the exercise, by completing the incomplete statement, or by writing the answer in the space(s) provided.

After you have completed all of these exercises, turn to "Solutions to Exercises" at the end of the lesson and check your answers. For each exercise answered incorrectly, reread the material referenced with the solution.

1. List the three types of presentations.

   _____.

   _____.

   _____.

2. _____ refers to the position of the spinal column of the fetus in relation to the spinal column of the mother.

3. List the four types of attitudes.

   _____.

   _____.

   _____.

4. What areas should be looked at for flexion?

   _____, _____, _____, _____.

5. The entrance of the presenting part of the fetus into the true pelvis or the largest diameter of the presenting part into the true pelvis is known as:

   _____.

6. The maternal pelvis is divided into _____.

7. Describe the following types of breech positions.

   Complete or full breech- _____
   _____.

   Frank and single breech - _____
   _____.

   Incomplete breech -_____.
   _____.

8. List the seven adaptations or cardinal movements that the fetus makes while in the vertex position.

   _____.

   _____.

   _____.

   _____.

   _____.

   _____.

   _____.

For exercises 9 through 16. The following phrases, terms, or definitions in Column A are closely related to the information listed in Column B. Place the letter of the correct answer in

COLUMN A	COLUMN B
___ 9. Abdominal palpation/ultrasound.	a. Zero (0) station.
___10. Fetus head is partially flexed or not flexed.	b. Longitudinal/transverse.
	c. Most common/easy delivery.
___11. Degree of flexion of the fetus body parts to each other.	d. Military/moderate flexion.
___12. Ischial spines.	e. Evaluation of presentation.
___13. First letter of position code.	f. Position.
	g. Attitude.
___14. LOA and ROA position.	h. Side of the pelvis of the fetus reference point.
___15. "Lie" positions.	
___16. Direction on the presenting part of fetus to the pelvis of the mother.	

Check Your Answers on Next Page

SOLUTIONS TO EXERCISES, LESSON 10

1. vertex or cephalic.
   Breech.
   Shoulder. (para 10-2b(1))

2. lie (para 10-2a).

3. complete flexion.
   moderate flexion or military attitude.
   poor flexion or marked extension.
   hyperextended. (para 10-2c(1))

4. head.
   Arches.
   Thighs.
   arms (para 10-2c(2)).

5. engagement (para 10-2e).

6. quadrants (para 10-2f(1)).

7. Complete or full breech--involves flexion of the legs. The fetus seems to be sitting in a tailor fashion.
   Frank and single breech--the fetus thighs are flexed on his abdomen, legs against his trunk, and feet are in his face.
   Incomplete breech--fetus feet or knees will appear first. (para 10-2f(4)

8. descent.
   flexion.
   engagement.
   internal rotation.
   extension.
   external rotation restitution.
   expulsion. (para 10-3b)

9. e (para 10-2b(3)).

10. d (para 10-2c(1)(b)).

11. g (para 10-2c).

12. a (para 10-2d(4)).

13. h (para 10-2f(3)(a)1).

14. c (para 10-2f(5)(a)).

15. b (para 10-2a).

16. f (para 10-2f).

End of Lesson 10

GLOSSARY

abortion Termination of pregnancy before the fetus is viable and capable of extrauterine existence.

amniocentesis The withdrawal of an amniotic fluid by insertion of a needle through the abdominal and the uterine wall.

amnion A smooth, slippery, glistening innermost membrane that lines the amniotic space.

amenorrhea The cessation of menstruation.

antepartal See prenatal.

attitude The degree of flexion of the fetus body parts (body, head, and extremities) to each other.

ballottement The fetus, when pushed, floats away and then returns to touch the examiner's fingers.

basal body temperature (BBT) A means to identify the time that ovulation occurs.

Bartholin's gland Two, small mucous glands situated on each side of the vaginal opening that secrete small amounts of mucus during intercourse.

breech Delivery of an infant feet or buttocks first.

blastocyst The inner solid mass of cells within the morula.

Braxton-Hick's contractions Painless uterine contractions occurring throughout pregnancy.

broad ligaments Two wing-like structures that extend from the lateral margins of the uterus to the pelvic walls and divide the pelvic cavity into an anterior and posterior compartment.

breast stimulation test (BST) A test that involves stimulation of the nipples (rubbing) which causes the posterior pituitary to release the hormone oxytocin, which in turn, causes contractions.

cardinal movements Movements made by the fetus during the first and second stage of labor.

cervix The narrow, inferior outlet that protrudes into the vagina.
Chadwick's sign Violet tinge of the cervical and vaginal mucous membranes due to the increased vascularity as a result of increased hormones.

chorion The outer fetal membrane that forms a large portion of the connective tissue thickness of the placenta on its fetal side.

chorionic villi Fingerlike tissue projections of chorion on the outer wall of the fertilized egg.

chromosomes Small, threadlike structures within each cell that contain genes which carry genetic instructions.

conception Fertilization; the joining together of the female sex cell and the male sex cell.

conjugate An important diameter of the pelvis, measured from the center of the promontory of the sacrum to the back of the symphysis pubis.

corpus luteum The yellow mass found in the graafian follicle after the ovum has been expelled.

contraction stress test (CST) A test to evaluate the respiratory function in the placenta.

Cowper's glands Two tiny pea-sized glands that are situated on either side of the membranous portion of the urethra inferior to the prostate.

dyspnea Difficult breathing.

EDC Estimated date of confinement.

edema Abnormal, excessive fluid within the body tissues.

embryo The early stage of development of the young of any organism when specific identification is difficult.

endometrium The inner lining of the uterus.

engagement The entrance of the presenting part of the fetus into the true pelvis or the largest diameter of the presenting part into the true pelvis.

epididymis A coiled tube about 20 inches long which serves as a temporary storage site for immature sperm.

estrogen The genetic term for the female sex hormones.

fallopian tubes Oviducts or uterine tubes leading from the uterine cavity towards each ovary.

fertilization The union of the male and female sex cells

fetal Pertaining to or related to the fetus.

fetus The child in utero from about the seventh to ninth week of gestation until birth.

fimbriae Fringes; especially the fingerlike ends of the fallopian tubes.

follicle A pouch-like depression or cavity.

follicle stimulating hormone (FSH) A hormone produced by the anterior pituitary during the first half of the menstrual cycle.

fundus The superior, rounded region above the entrance of the fallopian tubes.

fraternal twins Fetuses that develop from two fertilized oval; also referred to as dizygotic twins. They may be the same or different sex.

gene The smallest unit of inheritance; genes are located on the chromosomes.

genitalia Organs of generation, or reproduction.

gestation The period of intrauterine development from conception through birth; pregnancy.

Goodell's sign Marked softening of the cervix.

graafian follicle A mature, fully developed ovarian cyst containing a ripe ovum.

grandmultipara A woman who has had six or more births past the age of viability.

gravida A pregnant woman; refers to any pregnancy regardless of duration.

Hegar's sign Softening of the lower uterine segment just above the cervix.

hormone A chemical substance produced in an organ, which, being carried to an associated organ by the bloodstream, excites in the later organ a functional activity.

hydatidiform mole An abnormal growth of a fertilized ovum.

hyperemesis gravidarum Severe nausea and vomiting that lasts beyond the fourth month of pregnancy.

identical twins Twins developed from a single fertilized ovum, they are of the same sex.

in utero Within the uterus.

ischial spines Two relatively sharp bony projections protruding into the pelvic outlet from the ischial bones that form the lower lateral border of the pelvis. It is used in determining the progress of the fetus down the birth canal.

ischial tuberosities The major bony sitting support; important in measuring a transverse diameter of the pelvis.

isthmus The portion of the uterus that joins the corpus to the cervix.

labia majora Two fleshy, hair covered folds located on both sides of the perineal midline, extending from the mons veneris almost to the anus in women.

labia minora Two small folds of tissue covering the vestibule located just under the labia major in women.

lactation The production of milk by the mammary glands.

leukorrhea A white or slightly grey discharge from the vagina or cervix.

lie Refers to the position of the spinal column of the fetus in relation to the spinal column of the mother.

lightening The sensation of decreased abdominal distention produced by the descent of the uterus into the pelvic cavity.

linea nigra A black line in the midline of the abdomen that may run from the sternum or umbilicus to the symphysis pubis.

lunar months A period of four weeks (28 days).

luteinizing hormone A hormone produced by the anterior pituitary that stimulates ovulation and the development of the corpus luteum.

mask of pregnancy The brownish hyperpigmentation of the skin over the face and forehead. Also referred to as chloasma.

meiosis The process of cell division that occurs in the maturation of sperm and ova that decreases their number of chromosomes by one half.

menstruation The periodic discharge of blood, mucus, and epithelial cells from the uterus.

menopause The cessation of menstruation.

miscarriage Lay term for spontaneous abortion.

mons pubis The fatty, rounded area overlying the symphysis pubis and covered with thick coarse hair.

Montgomery's glands Small nodules located around the nipples that enlarge during pregnancy and lactation.

morning sickness Refers to nausea and vomiting usually in the morning during the first weeks of pregnancy.

mucous plug A collection of thick mucous that blocks the cervical canal during pregnancy.

multifetal pregnancy Pregnancy involving two or more fetuses.

multigravida A woman who has been pregnant more than once.

multipara A woman who has delivered two or more fetuses past the age of viability.

myometrium The muscle component of the wall of the uterus.

non-stress test (NST) A test to evaluate the ability of the placenta to supply fetal needs in a normal daily uterine movement.

nulligravida A woman who has never been pregnant.

nullipara A woman who has not delivered a child who reached viability.

obstetrics The branch of medicine concerned with the care of a woman during pregnancy, childbirth, and the postpartal period.

oxytocin challenge test (OCT) A dilution of I.V. solution of oxytocin administered to the mother until a contraction pattern is developed.

oocyte A developing egg in one of two stages.

oogenesis The production of female sex cells.

ovaries Two almond shaped glands that produce female hormones and female sex cells.

ovulation The release of an egg cell from a mature ovarian follicle.

ovum The female reproductive cell.

palpation Examination by touch or feel.

para A woman who has delivered a viable child (not necessarily living at birth).

penis The male organ of reproduction or copulation.

perineum The area of tissue between the anus and scrotum in the male or between the vagina and anus in the female.

peritoneum A strong, serous membrane that lines the abdomina-pelvic wall.

placenta A specialized disk-shaped organ that connects the fetus to the uterine walls for gas and nutrient exchange; also referred to as the afterbirth.

placental abruption Premature separation of a normally implanted placenta.

placenta previa A placenta that is implanted in the lower uterine segment so that it adjoins or covers the internal os of the cervix.

position The relationship between a predetermined point of reference or direction on the presenting part of the fetus to the pelvis of the mother.

postnatal Occurring after birth.

prenatal Before birth; also referred to as antepartal.

prenatal care The medical and nursing supervision and care given to the pregnant woman during the period between conception and the onset of labor.

pregnancy The condition of having a developing embryo or fetus in the body after fertilization of the female egg by the male sperm.

presentation That part of the fetus which is coming through or attempting to come through the pelvis first.

primigravida A woman pregnant for the first time.

primipara A woman who has delivered one child after the age of viability.

progesterone The pure hormone contained in the corpora lutea whose function is to prepare the endometrium for the reception and development of the fertilized ovum.

prostate gland A single gland about the size and shape of a chestnut.

quickening Fetal movement within the uterus.

reproduction The process by which an offspring is formed.

scrotum Pouch forming part of the male external genitalia containing the testicles and part of the spermatic cord.

seminal vesicles Two pouches that store sperm.

sex chromosomes The X and Y chromosomes which are responsible for sex determination.

sperm The male sex cell.

spermatogenesis The formation of sperm.

spermatozoa Mature sperm cells of the male produced by the testes.

station The depth that the presenting part has descended into the pelvis in relation to the ischial spine of the mother's pelvis.

striae gravida Marks noted on the abdomen and/or buttocks, commonly known as stretch marks.

term pregnancy A gestation of 38 to 42 weeks.

testes Two almond-shaped glands whose functions are for the production of sperm and testosterone.

testosterone The male sex hormone; responsible for the development of secondary male characteristics.

toxoplasmosis A congenital disease characterized by lesions of the central nervous system which may lead to blindness, brain defects, and death.

trimester A time period of three months.

uterus A hollow, muscular organ that serves as a protector and nourisher of the developing fetus and aids in its explosion from the body.

vagina Canal opening between the urethra and anus in the female that extends back to the cervix of the uterus.

varicose veins Permanently distended veins.

vas deferens Excretory duct of the testis.
vertex Top or crown of the head.

vestibule A space or cavity at the entrance to a canal.

viability The capability of a fetus to survive outside the uterus at the earliest gestation age, approximately 22 to 23 weeks gestation.

vulva The external structure of the female genitals, lying below the mons veneris.

X chromosome The female sex chromosome.

Y chromosome The male sex chromosome.

zygote The combined ovum and sperm; a fertilized egg.

End of Glossary